The Role of Parents in Preventing Childhood Obesity

Ana C. Lindsay, Katarina M. Sussner, Juhee Kim, and Steven Gortmaker

Summary

As researchers continue to analyze the role of parenting both in the development of childhood overweight and in obesity prevention, studies of child nutrition and growth are detailing the ways in which parents affect their children's development of food- and activity-related behaviors. Ana Lindsay, Katarina Sussner, Juhee Kim, and Steven Gortmaker argue that interventions aimed at preventing childhood overweight and obesity should involve parents as important forces for change in their children's behaviors.

The authors begin by reviewing evidence on how parents can help their children develop and maintain healthful eating and physical activity habits, thereby ultimately helping prevent childhood overweight and obesity. They show how important it is for parents to understand how their roles in preventing obesity change as their children move through critical developmental periods, from before birth and through adolescence. They point out that researchers, policymakers, and practitioners should also make use of such information to develop more effective interventions and educational programs that address childhood obesity right where it starts—at home.

The authors review research evaluating school-based obesity-prevention interventions that include components targeted at parents. Although much research has been done on how parents shape their children's eating and physical activity habits, surprisingly few high-quality data exist on the effectiveness of such programs. The authors call for more programs and cost-effectiveness studies aimed at improving parents' ability to shape healthful eating and physical activity behaviors in their children.

The authors conclude that preventing and controlling childhood obesity will require multifaceted and community-wide programs and policies, with parents having a critical role to play. Successful intervention efforts, they argue, must involve and work directly with parents from the earliest stages of child development to support healthful practices both in and outside of the home.

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Parents are key to developing a home environment that fosters healthful eating and physical activity among children and adolescents. Parents shape their children's dietary practices, physical activity, sedentary behaviors, and ultimately their weight status in many ways. Parents' knowledge of nutrition; their influence over food selection, meal structure, and home eating patterns; their modeling of healthful eating practices; their levels of physical activity; and their modeling of sedentary habits including television viewing are all influential in their children's development of lifelong habits that contribute to normal weight or to overweight and obesity.[1]

Because the parents' roles at home in promoting healthful eating practices and levels of physical activity—and thus in preventing obesity—are so critical, they should also be central to collective efforts to combat the nation's childhood obesity epidemic. L. Epstein offers three reasons for involving parents in obesity-prevention interventions. First, obesity runs in families, and it may be unrealistic to intervene with one member of a family while other family members are modeling and supporting behaviors that run counter to the intervention's goals. Second, parents serve as models and reinforce and support the acquisition and maintenance of eating and exercise behaviors. Finally, to produce maximal behavior change in children, it may be necessary to teach parents to use specific behavior-change strategies such as positive reinforcement.[2] Several successful school-based health-promotion interventions, such as Planet Health and Eat Well and Keep Moving, already include a component targeted at improving parenting behaviors, as does the well-established Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) public health and educational program.[3] Because research shows how the parents' roles in influencing the development of overweight and obesity differ at different stages of their children's development, these parenting components will be most effective if they are targeted at children in particular age groups.

Parental Roles during a Child's Development

Parenting influences the development of overweight and obesity in various ways at different stages of a child's development. The following discussion is structured around three time periods in children's lives: gestation and early infancy; early childhood, when children are toddlers or preschoolers; and middle childhood and adolescence, when children are attending school.[4]

Gestation and Infancy

Before an infant is even born, aspects of his mother's pregnancy can put him at risk of overweight in childhood and later in life.[5] An unfavorable intrauterine environment, for example, can increase a fetus's future risk of developing adult metabolic abnormalities, including obesity, hypertension, and non-insulin-dependent diabetes mellitus.[6] The children of mothers who suffer from diabetes mellitus, gestational diabetes, and undernutrition and overnutrition during pregnancy are at particular risk for obesity, with the greatest risk factor being gestational diabetes.[7] A key strategy for obesity prevention at this stage of a child's development, therefore, is to focus on screening for and preventing diabetes during pregnancy.

Parents also have an important role to play during infancy, when a child is establishing the foundation for dietary habits and nutritional adequacy over a lifetime.[8] Although

debate over whether breast-feeding can help prevent obesity later in life continues, many researchers believe that breast-feeding infants does have a protective effect against obesity. Several studies, for example, have documented lower rates of overweight among children who were breast-fed for longer durations.[9] Their findings, however, were limited to non-Hispanic whites and did not apply to other racial or ethnic groups.[10] One explanation for the protective effect of breast-feeding is that it helps infants better regulate their food intake than does bottle-feeding. Encouraging an infant to empty a bottle and using formulas more concentrated in energy and nutrients than breast milk may make it more difficult for the baby to attend to his or her own normal feelings of satiety. If such experiences occur early in infancy and continue, an infant may not develop reliable control over food intake. None of the recent studies of breast-feeding, however, rules out the possibility that the protective effect of breast-feeding on obesity later in life may be due to confounding factors such as parental weight status or social and economic status.[11]

Toddlers and Preschool Children

As toddlers and preschoolers develop habits related to eating and physical activity, parents can shape their early environments in ways that encourage them to be more healthful.[12]

Parents and Healthful Food Behaviors

Children come equipped with a biological set of taste predispositions: they like sweet and salty tastes and energy-dense foods, and they dislike bitter and sour tastes.[13] But they develop most of their food habits through exposure and repeated experience. Research suggests that individual differences in the physiologic regulation of energy intake appear as early as the preschool years and that parents have enormous influence on these differences.[14] Current data, although limited, suggest that the way parents feed their children contributes to individual differences in how well children can regulate their food intake and perhaps to the origins of energy imbalance.[15] Especially in the early years of a child's life, parents have a direct role in providing experiences that encourage the child's control of food intake. Around preschool age, when children particularly dislike new foods, it is important for parents to model healthful eating habits and to offer a variety of healthful foods to their children. When parents provide early exposure to nutritious foods, even fruits and vegetables, children like and eat more of such foods.[16] But parents should observe a clearly defined role in offering the foods to their children. As described by W. Dietz and L. Stern, parents "are responsible for offering a healthful variety of foods," while children themselves "are responsible for deciding what and how much they want to eat from what they are offered."[17]

Although children are predisposed to respond to the energy content of foods in controlling their intake, they are also responsive to their parents' control attempts. Research has shown that these attempts can refocus the child away from responsiveness to internal cues of hunger and satiety and toward such external factors as the presence of palatable foods.[18] Parents who control or restrict what their young children eat may believe they are doing what is best for their child, but recent research challenges this assumption. Imposing stringent controls can increase preferences for high-fat, energy-dense foods, perhaps causing children's normal internal cues to self-regulate hunger and satiety to become unbalanced.[19]

Parents should also be aware of the social contexts in which foods are consumed. Stud-

ies have found that children develop preferences for foods offered in positive contexts and, conversely, are more likely to dislike foods offered in negative contexts.[20] Offering healthful foods in positive contexts will encourage youngsters to enjoy and eat such foods.

Another important influence on the types of food young children consume is a household's food choices. At an early age children will eat what their parents, especially their mothers, eat.[21] And if parents overeat, their children may too. Thus the parents' own eating behaviors may contribute to the development of overweight in their children.[22] The types of food available and accessible in the home are also linked with the weight status of preschool children. Research suggests, for example, that increased consumption of sugar-sweetened drinks, like fruit juice, might raise the risk of overweight among preschool children.[23] One study found that children aged two to five years who drank more than twelve ounces of fruit juice a day were more likely to be overweight than those who drank less.[24] More recently, a study of two- to three-year-old children found that for those who are at risk for overweight, consuming sweet drinks as infrequently as once or twice daily increased their odds of becoming overweight.[25] These findings are consistent with those of long-term studies and interventions focused on sugar-sweetened beverages among school-aged children, although some smaller long-term studies in children found no significant link between fruit juice intake and overweight.[26]

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Parents and Physical Activity during Early Childhood

Physical activity is a key component of energy balance, and keeping small children active is an essential part of preventing child overweight.[27] Research has found that physical activity is associated with lower risks of accelerated weight gain and excess adiposity among preschool-aged children.[28] An eight-year study of three- to five-year-old children found that the most active children had significantly lower body mass index (BMI) than their less active counterparts.[29] A study of three- to five-year-old children attending preschool found that overweight boys were significantly less active than normal-weight boys during the preschool day.[30]

Few studies have examined the relationship between the activity levels of parents and their young children. The Framingham Children's Study, however, monitored physical activity with a mechanical device—the Caltrac accelerometer—in four- to seven-year-old children and their parents and found that the children of active mothers were twice as likely to be active as children of inactive mothers. When both parents were active, these children were 5.8 times more likely to be active than the children of two sedentary parents.[31]

A few studies of preschool children have found that the more time children spend outdoors, the higher their activity levels.[32] These

findings suggest that parents can and should encourage outdoor play. Questions of safety and accessibility, however, may make it more difficult for some parents and children to spend time outdoors. Minority and lower-income parents, for example, are more likely to live in communities with fewer parks, sports facilities, bike paths, and other places for children to be active and safe.[33]

Although most research on television viewing's influence on child obesity has been conducted among older children and adolescents, some studies have focused on preschool-aged children. A study of five- and six-year-old Hispanic (predominantly Mexican American) children in Chicago found a link between TV viewing and overweight.[34] R. H. DuRant and several colleagues directly observed three- and four-year-old children in their homes and found that children who watched TV more hours a day and children who watched for longer periods of time at one sitting were less likely to engage in physical activity.[35] Another study of 2,761 adults with children aged one to five years from forty-nine New York State WIC agencies found that viewing TV and videos and having a TV in the bedroom were both linked with the prevalence of child overweight.[36] These studies indicate that parents should limit preschoolers' TV and video viewing and keep televisions out of their bedrooms.

School-Aged Children and Youth

National data indicate that 16 percent of children aged six to nineteen years are overweight.[37] As children grow older and as they focus less on family and more on school, peers, and different media, parental influence wanes. As adolescents, children spend increasingly more time away from home, become more exposed to environments that encourage obesity, and have greater choices in their own diet and physical activities. When children make critical decisions about nutrition and physical activity on their own, parents' roles become even more challenging. Nevertheless, parents and family members can still provide a healthful home nutrition and physical activity environment.

Parents and Healthful Eating in School-Aged Children

Parents can encourage healthful eating habits at home by increasing the number of family meals eaten together, making healthful foods available, and reducing the availability of sugar-sweetened beverages and sodas.

Studies show that eating dinner together as a family promotes healthful eating among children and adolescents by increasing their consumption of fruits, vegetables, and whole grains and reducing their consumption of fats and soft drinks.[38] These same studies, however, show that families eat dinner together less often as children grow older. One study found that nine-year-olds ate dinner with their family roughly half the time, while fourteen-year-olds ate dinner with their families only a third of the time.[39] It is crucial, therefore, that parents maintain family eating practices throughout adolescence.

As with preschool-aged children, the availability of foods at home is a major influence on older children's diets. Studies have found that making fruits and vegetables available at home increases children's consumption of these foods.[40] And parents must not only provide healthful foods at home, but also eat these foods themselves.

Between 1965 and 1996, adolescents' soft drink consumption increased 150 percent while their consumption of fruit drinks increased 89 percent. As with young children,

several studies indicate that sugar-sweetened beverages may play an important role in the childhood obesity epidemic.[41] A long-term study of children that began when they were eleven and twelve years old found that their odds of becoming overweight increased 60 percent for each additional serving of sugar-sweetened drinks consumed daily.[42] A second long-term study, this one beginning when children were nine to fourteen years old, linked consumption of sugar-added beverages with increased weight gains.[43] In a randomized controlled trial in England, reducing consumption of carbonated beverages lowered the prevalence of overweight among seven- to eleven-year-olds.[44] Such findings show how important it is for parents to limit their children's consumption of these beverages at home. Now that many schools are making a commitment to soda-free hallways and cafeterias, parents can follow their lead and keep their homes free of sugar-sweetened beverages as well.

Parents and Older Children's Activity Levels

Children and adolescents spend more time watching television than they do in almost any other activity. By the time they reach school-age, about half of U.S. children watch television more than two hours a day, and 17 percent of African American children watch more than five hours a day.[45] Many studies link TV viewing with overweight.[46] Randomized controlled trials indicate that watching fewer hours of TV can reduce children's body mass index and obesity risk.[47] TV viewing, therefore, may be one important cause of childhood obesity that parents can modify at home.

TV viewing may increase overweight both by reducing children's physical activity and by encouraging poor eating habits in children by exposing them to commercials for unhealthful foods.[48] Experimental results suggest both factors are at work.[49] According to a recent nationally representative survey, children from third through twelfth grade spend an estimated eight hours a day of media time —using computers, listening to music, watching movies, playing computer and video games, and watching TV. About 26 percent of children are "media multitaskers" who go online while they watch TV, resulting in more exposure to the media environment simultaneously.[50]

Studies of the contents of television advertisements document that children are exposed to a vast number of TV ads for sodas, cereal, candy, and fast food.[51] And other research suggests that exposure to food commercials influences children's preferences and food requests and can contribute to confusion among children about the relative health benefits of foods.

Recent data indicate that 68 percent of children have a TV in their bedroom, and half have a video game player and a VCR or DVD player as well. Increasing numbers of children also have cable or satellite TV, computer, and Internet access in their bedrooms. Despite such widespread access, more than half of children report that they have no parental rules on TV watching hours. Among those reporting such rules, only 20 percent said parents enforce them "most" of the time.[52] Limiting physical access to TV may help children reduce their TV viewing.[53] Children with a TV in their room spend an estimated 1.5 hours more a day watching TV than do those without a set in their room.[54]

Parents can also help by limiting their own TV watching and sedentary behavior. Studies show that when parents are sedentary, their

A Word of Caution to Parents about Encouraging Child Dieting

Even though childhood obesity experts discourage dieting, parents who feel the need to control a child's weight commonly encourage dieting. Studies on dieting behaviors consistently report that their parents' inducement to diet is the most significant factor in causing children to begin dieting. Their parents' direct verbal encouragement is more influential than the parents' own dieting behaviors.

Many adolescents whose parents urged them to diet report engaging in unhealthful dieting behaviors. Focusing on dieting for weight control may overemphasize the thinness ideal and over time may even lead to an increased risk for obesity. It is important for parents of overweight children to learn about the dangers of dieting and to talk with their child's doctor or health care provider about ways to promote healthful habits.

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children are more likely to be sedentary as well.[55] Adolescents whose parents watch TV more than two hours a day are more than twice as likely to be physically inactive as those children whose parents watch less.[56]

During the transition from childhood to adolescence, children's physical activity drops off dramatically.[57] Although current guidelines recommend at least sixty minutes of physical activity for older children on most, preferably all, days of the week, only 63 percent of adolescents reported meeting those guidelines in 1999.[58] Parents can encourage older children to be more active. Studies suggest that participating in sports teams or exercise programs can help adolescents reduce their body mass index.[59]

Some studies have found that children are more likely to be active if their parents are active, while others do not find this relationship and rather emphasize the importance of parental support.[60] Many studies show that parents can promote children's physical activity by providing support and encouragement.[61] Further, those parents who realize the importance of physical activity may offer even greater support.[62] That support can take many forms: arranging access to after-school or community sports and activity programs, watching children's activities, or simply playing with their children.[63] Parents' views about their children's competence and task orientation may also affect their physical activity.[64] Concerns about traffic, drug dealers, crime, and violence may cause parents to limit places where their child can play, thereby reducing their opportunities for activity.[65]

Family-Based Obesity-Prevention Programs

Although a great deal of research has been done on how parents shape their children's eating and physical activity habits, surprisingly few high-quality data exist on the effectiveness

of obesity-prevention programs for children that center on parental involvement. One reason for the paucity of data is that, despite some studies that indicate promising results, few programs are solely parent-based. Most efforts to involve parents are components of more comprehensive interventions. For example, many school-based programs aimed at preventing childhood obesity are targeted at children within school settings but include parental components that help parents set limits on TV viewing and provide electronic "lock-out" devices.[66] Likewise, health care–based interventions may add a parenting focus. Meanwhile, a WIC-sponsored nutrition intervention will take place within the context of WIC, but it might add a parental component aimed at reducing TV time.[67]

Creating more programs to improve parenting behaviors relevant to childhood overweight is a highly promising strategy.

As yet little to no information is available on the cost-effectiveness of obesity-prevention interventions that have a parenting component. One middle-school program called Planet Health was found to be highly cost-effective—in fact, more cost-effective even than commonly accepted preventive interventions such as screening and treatment for hypertension.[68] Precisely what influence the program's parental component specifically generated, however, is unclear. Nevertheless, creating more programs to improve parenting behaviors relevant to childhood overweight is a highly promising strategy. Such programs would be most effective if they were targeted at children of various ages based on research that shows how parents can best help children at different developmental stages. Researchers should carefully evaluate the programs' effectiveness.

Solely Parent-Based Interventions

One solely parent-based intervention consisted of twenty-eight families of seven- to twelve-year-old African American children who received primary care at an urban community clinic serving a low-income population. Families were randomly selected to receive counseling alone or counseling plus a behavioral intervention that included an electronic television time manager. Both groups reported similar decreases in their children's use of television, videotapes, and video games. The behavioral intervention group reported significantly greater increases in organized physical activity and somewhat greater increases in playing outside. Changes in overall household television use and in meals eaten while watching television also appeared to favor the behavioral intervention, with small to medium effect sizes, but these differences were not statistically significant.[69]

Another recent solely family-based intervention tested two versions of a culturally relevant program to prevent excess weight gain in pre-adolescent African American girls. The girls, aged eight to ten years, were divided into two groups, both of which participated in highly interactive weekly group sessions. In one group, the sessions targeted the girls; in the other, the sessions were geared toward their parents or caregivers. Girls in both groups demonstrated a trend toward reduced body mass index and waist circumference. In addition, girls in both groups reduced their consumption of sugar-sweetened beverages, increased their level of moderate to vigorous

activity, and increased their daily serving of water.[70]

Comprehensive Interventions with a Parenting Component

Most interventions aimed at preventing overweight and obesity have been school-based, and all have improved health knowledge and health-related behaviors to some extent.[71] Some of the most successful school-based interventions, however, have included a parenting component. These interventions have resulted in dramatic changes in health behaviors associated with child obesity and overweight as well as in changes in body mass index or obesity.

School-based interventions at the preschool level are scarce, but one study's findings provide strong support for establishing such programs. The Hip-Hop to Health Jr. program targeted three- to five-year-old minority children enrolled in Head Start programs in Chicago, with the aim of reducing the tendency toward overweight and obesity in African American and Latino preschool children. The intervention presented a developmentally, culturally, and linguistically appropriate dietary and physical activity curriculum for preschoolers, and a parent component addressed the families' dietary and physical activity patterns. Each week of the intervention covered a particular topic, such as the importance of "Go and Grow" foods, eating fruit, and reducing TV viewing. Parents received weekly newsletters with information that mirrored the children's curriculum on healthful eating and exercise as well as a five- to fifteen-minute homework assignment that reinforced concepts presented in the weekly newsletters. During the fourteen-week intervention, children in a control group attended a twenty-minute class once a week in which they learned about various general health concepts, such as dental health, immunization, seat belt safety, and 911 procedures. Their parents' weekly newsletters mirrored these sessions. A recent two-year follow-up study found that the intervention group's children had significantly smaller increases in body mass index than did those in the control group.[72]

Another recent study assessed the impact of the school-based Child and Adolescent Trial for Cardiovascular Health (CATCH) intervention among primarily Hispanic, low-income elementary school children. The intervention tested the effectiveness of changes in school food service, physical education, classroom curricula, and family activities. The family component consisted primarily of skill-building activity packets that students took home to complete with their parents. Third and fourth graders and their families were also invited to participate in Family Fun Nights at the school. The family component supplemented the classroom curriculum, which focused on improving the children's dietary and physical activity knowledge, attitudes, and self-reported behaviors, and reinforced the concepts, activities, and skills of the curriculum. Among both boys and girls, the intervention reduced overweight or the risk of overweight.[73]

Another successful elementary school–based health behavior intervention on diet and physical activity was the Eat Well and Keep Moving program. Classroom teachers in math, science, language arts, and social studies classes taught the quasi-experimental, two-year field trial among children in grades four and five, with six intervention and eight matched control schools. The intervention provided links to school food services and families and provided training and wellness programs for teachers and other staff mem-

bers. Its aim was to decrease the consumption of foods high in total and saturated fat, to increase fruit and vegetable intake, to reduce television viewing, and to increase physical activity. Compared with students in the control schools, students in the intervention schools reduced their share of total energy from fat and saturated fat. They also increased their fruit and vegetable intake, vitamin C intake, and fiber consumption. They reduced their television viewing marginally.[74]

A systematic review of research on family involvement in weight control recently found that relatively few intervention studies exist, but those few suggest that parental involvement helps children lose weight.

Recently, a pilot study divided children in four elementary schools into an intervention group and a control group and evaluated how a school-based health report card affected family awareness of and concerns about child weight status, plans for weight control, and preventive behaviors. Parents of overweight children (including those at risk of overweight) in the intervention group had greater awareness of their children's weight status and initiated more activities to control weight than did the parents of children in the control group.[75]

Planet Health was a two-year, school-based health behavior intervention targeting middle school–aged boys and girls in sixth through eighth grades. Students participated in a school-based interdisciplinary program that used existing classroom teachers and took place in four major subjects and physical education classes. Sessions focused on decreasing both television viewing and the consumption of high-fat foods and on increasing both fruit and vegetable intake and physical activity, with no explicit discussion of obesity. Compared with girls in the control group, girls in the intervention group reduced their prevalence of obesity; no differences were found among boys. The intervention reduced television hours among both girls and boys, increased fruit and vegetable consumption among both girls and boys, and reduced total energy intake among girls in the intervention group compared with girls in the control group. Among girls, obesity prevalence was reduced for each hour that television viewing was reduced. Although not primarily a parent-focused program, Planet Health had several family components, including an activity called "Power Down," where the household together engaged in a TV charting exercise to reduce TV time.[76] Further analysis of Planet Health found a reduced risk of disordered, or unhealthy, weight control behaviors in girls. An economic analysis found the program substantially cost-effective.[77]

Obesity-related interventions have also focused on limiting television viewing.[78] A recent randomized control trial called "Switch-Play" aimed to replace TV viewing time with more physical activities. More than half the children reported reducing their TV viewing while less than half increased physical activity. Most of the children enjoyed alternative activity programs, and only 7 to 17 percent had difficulty turning off their favorite TV shows.[79]

An after-school intervention known as the GEMS pilot study tested the feasibility, acceptability, and potential efficacy of after-school dance classes and a family-based intervention to reduce television viewing and weight gain among African American girls in Stanford, California. At the follow-up, girls in the intervention group exhibited trends toward lower body mass index and waist circumference, increased after-school physical activity, and reduced television, videotape, and video game use, as compared with the control group. The treatment group also reported significantly reduced household television viewing and fewer dinners eaten while watching TV.[80]

Although intervention studies show the benefit of cutting TV hours, such practical barriers as long hours of parental work and inadequate child care options make it difficult for families to implement these changes. For many families, particularly in low-income, urban areas without safe places to play outdoors, TV is a substitute babysitter. Mothers are often more concerned with the types of TV programs their children watch than with how much time their children spend watching TV. These mothers raise the issue of affordable and accessible recreation facilities and programs and say the lack of such options contributes to their children's watching more TV at home.[81]

A systematic review of research on family involvement in weight control recently found that relatively few intervention studies exist, but those few suggest that parental involvement helps children lose weight.[82] The studies also indicate that results, in terms of weight loss and behavioral changes, are better when children are treated together with their parents.[83] Involving at least one parent in a weight-loss process improves overall short- and long-term weight regulation, as does overall support from family and friends.[84] For families with several members battling overweight, family treatment can substantially reduce the per-person costs of obesity treatment, and children and their parents can achieve similar percentages of overweight change.[85]

Conclusion

Parents play a critical role at home in preventing childhood obesity, with their role changing at different stages of their child's development. By better understanding their own role in influencing their child's dietary practices, physical activity, sedentary behaviors, and ultimately weight status, parents can learn how to create a healthful nutrition environment in their home, provide opportunities for physical activity, discourage sedentary behaviors such as TV viewing, and serve as role models themselves. Obesity-related intervention programs can use parental involvement as one key to success in developing an environment that fosters healthy eating and physical activity among children and adolescents.

Although few interventions solely target parents, current evidence suggests that parenting interventions may work best as a component of comprehensive interventions within a variety of settings, including schools, health services, or such programs as WIC. Recent research highlights the success of school-based programs, such as Planet Health, CATCH, Eat Well and Keep Moving, and the GEMS pilot study, that incorporate parenting and at-home components into their curricula.[86] Another potential avenue is to incorporate parenting education modules into well-established public health and educational programs, such as WIC, Head Start, and birthing

classes, following the model of such programs as Hip-Hop to Health Jr.[87]

As more of these interventions are created, researchers should carefully evaluate their cost-effectiveness. New interventions should replace those that are based either in school alone or in a health center alone with strategies that affect multiple settings at the same time.[88] Community, statewide, and national obesity-prevention programs should emphasize an educational collaboration among schools, health centers, and parents.

Achieving the goal of preventing and controlling the childhood obesity epidemic requires multifaceted and community-wide programs and policies. But even in such broad and comprehensive programs, parents have a critical and influential role to play. Interventions should involve and work directly with parents from the very earliest stages of child development and growth both to make healthful changes at home and to reinforce and support healthful eating and regular physical activity.

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