



ozgurcankaya

Clinical strategies for addressing obesity in infants and toddlers

Abstract: Babies' earliest food experiences have a lifelong impact on eating preferences and dietary habits, laying the foundation for obesity risk. NPs have the opportunity to provide education about healthy infant feeding practices before the growth trajectory becomes abnormal and focus intensive education on at-risk families.

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Obesity is an illness that touches the practice of nearly every NP. Obesity is generally linked to worsening health as well as psychological and societal conditions, and this may especially be true when the condition develops earlier in life.¹⁻³ Interventions to reduce obesity have primarily focused on older children and adults, but have been relatively unsuccessful in reversing rates and severity of disease.^{4,5} Once established, obesity is difficult to cure.

Children's earliest experiences with food influence eating habits over the course of a lifetime. Evidence suggests that some maternal characteristics (for example, anxiety, stress, and depressive symptoms), as well as specific infant feeding practices (for example, introducing solid foods too early or too late, pressuring to eat, and restricting foods) are associated with childhood obesity and obesogenic eating habits.⁶⁻¹² NPs are in an ideal position to intervene early, even before the growth trajectory

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begins to shift; yet, pediatric primary care providers struggle with providing education for children at risk for obesity and diagnosing pediatric overweight and obesity.¹³ To ameliorate the obesity epidemic, NPs must recognize and address early-life risk factors and provide early education, regardless of the child's weight status.

The purpose of this article is to review maternal characteristics and complementary feeding practices (CFP)—the way solid foods are introduced to babies—that increase the risk of rapid weight gain and/or obesity in infants, and to provide specific examples for anticipatory guidance in practice. NPs who provide care for children are in a unique position to provide CFP education to all families, regardless of weight. Yet they also have an opportunity to identify at-risk mother-baby duos and provide more intensive education. Early education for all families, along with focused education for at-risk ones, may be an avenue to preventing or slowing the development of childhood obesity. Awareness of the risk factors will equip NPs with information to facilitate conversations about healthy weight promotion with families.

■ Significance

Obesity is a public health crisis in the US. The percentage of children living with obesity has more than tripled over the last 40 years.¹⁴ A child who is overweight is more likely to become an adult who is obese, and a child with obesity is more likely to suffer from chronic illnesses (for example, cardiovascular disease, type 2 diabetes mellitus, obstructive sleep apnea, and hyperlipidemia), many of which previously only existed in adulthood.^{2,15-20} Obesity and its associated chronic illnesses tend to be worse the earlier in life they develop.¹⁵⁻¹⁷ As a result, childhood obesity is associated with premature mortality, increased morbidity, and decreased health-related quality of life.^{15,17} Hence, obesity has emerged as an independent risk factor for increased disease severity and mortality in those who contract coronavirus disease 2019 (COVID-19).²¹ Largely due to the obesity epidemic, for the first time in over 2 centuries, the life expectancy of a child born in the US may be shorter than that of his or her parents.²²

It is clear that obesity poses major health consequences, but addressing it in practice has been historically difficult for primary care providers due to knowledge and time limitations.¹³ Interventions that target older children and adults have been intensive and minimally successful. Yet, an infant's experience with

food lays the foundation for obesity risk. By the age of 3, shortly after a child has transitioned to solid foods, dietary patterns begin to stabilize and may persist into adolescence and adulthood.^{23,24} Because of this sensitive period in preference and habit development, it is imperative that NPs focus their efforts on their younger patients and families. If NPs are able to provide education and counseling before a baby becomes overweight, and focus intensive education on families with higher risk, they may significantly reduce the child's risk for future comorbidities.

■ Complementary feeding practices, pickiness, and weight

Evidence supports a relationship between CFP and dietary intake or pickiness. A common fear among parents and clinicians is child pickiness (that is, dietary intake marked by limited variety of foods and nutrients and rejection of novel foods).^{25,26} Yet clinicians are often unsure how to address this phenomenon in practice. Research suggests that modified CFPs may influence the outcomes of dietary intake and weight. Feeding prepackaged foods and a prolonged liquid or pureed diet with late introduction of lumpy foods (for example, mashed banana, avocado, or steamed vegetables) past 9 months of age is associated with more picky eating.²⁷ Conversely, serving fresh fruit, early introduction of a variety of flavors, modeling of healthy eating by parents, reoffering of refused foods, and mealtime structure are associated with decreased pickiness.²⁷⁻²⁹ Contrary to its intent, the act of pressuring children to eat is associated with increased picky eating, while decreased pressure is associated with increased fruit and vegetable intake.^{10,11,29,30} Introduction of complementary foods prior to 4 months of age is associated with increased consumption of snacks and treats and fewer fruits and vegetables, both of which increase the risk of obesity over time.^{31,32}

There is also a relationship between dietary intake and weight. The consumption of sugar-sweetened beverages in early childhood has been consistently linked to increased weight status and obesity in childhood and adolescence.³³ Using bottles after 12 months of age is also associated with increased weight at age 12-36 months.³⁴ Interestingly, picky eating is associated with lower weight status in preschool and school-aged children.²⁵ Despite common parental concerns related to pickiness, it may actually be protective against overweight and obesity in early life.

Evidence also supports a relationship between CFP and weight status. Infants who consume complementary foods before the age of 4 months are more likely to be overweight or obese as toddlers, preschoolers, and older children (that is, 5–10 years of age).^{9,32} The style in which complementary foods are given to babies is also related to weight outcomes in children. Responsive feeding refers to the reciprocity between infant and caregiver. It encourages parental awareness of hunger and satiety cues and creates an environment in which a child can develop skills to independently and healthfully consume meals.³⁵ Nonresponsive feeding methods, such as pressuring to eat, restriction, or control, have been associated with increased weight status and problematic eating behavior in children.^{11,36} Similarly, an indulgent feeding style, marked by increased sugar-sweetened food and beverage consumption, is associated with increased weight in toddlers and preschoolers.^{33,37}

■ Maternal psychosocial characteristics and complementary feeding practices

A mother makes the majority of feeding decisions for her baby, and her psychological state influences these decisions.^{6,7,31,38–40} Mothers with higher symptoms of stress, anxiety, or depression are more likely to exhibit nonresponsive feeding practices with their babies.^{6,39} For example, higher maternal anxiety, stress, and depressive symptoms are associated with controlling or forceful feeding, such as verbal or physical pressure to eat, and incentives or rewards for eating.^{6,7} These practices are associated with an increase in child food refusals, pickiness, and eating in the absence of hunger—behaviors that increase the risk of obesity later in life.^{11,41–43} Mothers with higher anxiety symptomatology are also more likely to exhibit forceful feeding, overfeeding, or feeding unhealthy foods.^{38,44} Restrictive feeding, such as limiting the amount of food offered, or waiting to feed a baby, despite his/her signs of hunger, is more common in mothers with higher anxiety

or stress, and is associated with increased consumption of the restricted food.^{32,38,39,42} Nonresponsive feeding practices, such as use of food as a reward and restriction of foods, have been linked to poor eating patterns and increased weight trajectory in children. Conversely, pressuring to eat has been linked to lower weight status, including underweight, and increased pickiness.^{11,42}

Evidence suggests that maternal attitudes impact CFP.^{31,40} For example, mothers tend to be more concerned about a baby being underweight than overweight, and they tend to overestimate underweight status and underestimate overweight status.³¹ As many as one-third of mothers are concerned that their child does not eat enough, which is troubling, given maternal responses to these perceptions.⁴⁰ Concern about underweight is associated with early introduction of solid foods, before a baby is ready to process and digest them.^{31,43} Conversely, maternal concerns of overweight are associated with restrictive feeding practices, which have been shown to inhibit child regulatory mechanisms and actually increase the child's consumption of the restricted food, setting the pattern for lifelong unhealthy eating habits.^{31,45}

■ Application for practice

NPs are critical frontline providers with great potential to impact the growing obesity epidemic. Recognizing the pediatric patient as a product of his or her family environment provides a context for clinical strategies. Three key areas for pediatric clinical focus are presented below.

First, beginning family education about healthy feeding practices at an infant's first well-baby visit is critical to promoting healthy weight gain. NPs are poised to provide healthy CFP counseling to all parents, regardless of the infant's size, and in particular because parents are not good evaluators of their infant's weight status.³¹ At each well-baby check, healthy CFP should be a cornerstone of anticipatory guidance (see *Complementary feeding strategies to reduce obesity risk*). Parents should be advised to continue exclusively breastfeeding or formula feeding their baby until around 6 months of age.⁴⁶ Then, solid foods can be introduced gradually, focusing on the baby's development and hunger and satiety cues. The baby should be able to hold his/her head up while seated in a high chair, open his/her mouth when offered food, and move food from a spoon to his/her throat before introduction of solid foods.⁴⁶ With early feeds, the baby

Complementary feeding strategies to reduce obesity risk^{33–35,46}

- Wait until around 6 months of age to introduce complementary foods
- Discontinue the use of bottles after 12 months
- Observe the baby for signs of hunger and fullness
- Limit sugar-sweetened beverages and treats to rare occasions

will only eat a few bites, once per day, but by around 9 months, he/she will be eating full servings (two to three tablespoons) of meat, fruits or vegetables, and/or grains, two to three times per day.^{47,48}

Similarly, at each well-baby visit before the first birthday, clinicians should counsel parents to limit sugar-sweetened foods to rare occasions, and to discontinue bottles at 12 months. Finally, NPs should counsel all parents on responsive feeding measures, such as allowing the baby to self-feed, creating a pleasant structure for feeding, and avoiding pressure, control, incentives, or bribery surrounding food and feeding (see *Examples of responsive feeding measures*).³⁸

The second key area for clinical focus involves screening and identification of maternal mood and anxiety disorders. Maternal psychosocial characteristics are associated with CFP, as well as other developmental and emotional challenges.⁴⁹ Despite the convincing rationale for early identification and treatment of maternal mood and anxiety disorders, as well as the American Academy of Pediatrics guidelines for maternal depression screening during a baby's first 6 months of life, only 44% of pediatricians reported screening for maternal depression in 2013.^{49,50} Pediatric healthcare providers are hesitant to screen mothers because they do not recognize the mother as their patient, lack mental health training, or lack time or resources.⁵¹ Yet, screening and intervention are necessary and can be implemented briefly during pediatric well-baby visits. One possible assessment is the Patient Health Questionnaire-4 (PHQ-4), which is a free, standardized, validated screening tool available in over 50 languages.⁵² Unlike the Edinburgh Postnatal Depression Scale, commonly used in practice, the PHQ-4 is ultra-brief, screens for both anxiety and depression, and can easily be incorporated into intake paperwork or collected orally along with the baby's history.⁵³ After identifying at-risk parent-baby duos, NPs and their support staff should provide educational materials and referrals to community resources for affected mothers. These mothers may also need more intensive education about responsive feeding practices. Given the high rates of postpartum anxiety and depression in the US, early identification will help providers identify families at higher risk for unhealthy CFP and focus their attention on families with a higher need for education about healthy CFP.⁴⁹

The third key area of clinical focus involves inquiring about and addressing maternal concerns about weight and feeding. Because maternal concerns can

Examples of responsive feeding measures^{6,35,36,42}

- Recognize and respond to baby's hunger and satiety cues
- Allow baby to self-feed when he/she expresses a desire
- Ensure feeding experiences are pleasant and free of distractions
- Seat baby in a high chair, facing others
- Provide healthy and tasty foods
- Feed on a predictable schedule
- Avoid pressuring to eat
- Avoid bribery or incentives for eating
- Avoid using food as a reward
- Avoid restricting foods or food groups entirely

Strategies to reduce pickiness²⁷⁻²⁹


- Introduce lumpy foods before 9 months
- Limit feeding of prepackaged foods
- Serve plenty of fresh fruits and vegetables
- Reoffer a refused food 10 or more times
- Offer a variety of flavors
- Create a structure for meals (for example, feed in a high chair, at the table, with family, and with no TV or phones to distract)
- Role-model eating and enjoying healthy foods

lead to suboptimal feeding practices, NPs must teach parents about responsive feeding before lifelong habits are established. At the same time, NPs can address feeding challenges, especially picky eating, and provide education on strategies to reduce pickiness (see *Strategies to reduce pickiness*). This includes creating a structured environment for feeding, and modeling of eating and enjoying healthy foods. It also includes introducing the baby to lumpy foods before 9 months, and offering a variety of fresh fruits and vegetables, while limiting prepackaged or sweetened foods. Parents should also be advised that babies may need to try a food repeatedly, sometimes 10 times or more, before accepting it. Further education should focus on reassuring families that pickiness is normal for toddlers and preschool-aged children, and that most picky eaters consume adequate nutrients.²⁶

Conclusion

NPs have ongoing opportunities to slow or reverse the escalating rate of childhood obesity in the US, particularly by intervening during the sensitive period of complementary feeding. NPs are poised to provide parents with evidence-based information about CFP that are associated with healthy growth trajectories. At the same time, they must recognize and offer supportive interventions

to parents struggling with high stress, anxiety, or depressive symptoms, as those are associated with suboptimal CFP.

Addressing weight in primary care is not easy for healthcare providers, and is made more difficult by the fact that many parents have misperceptions of their child's weight status.³¹ Yet, given the evidence, it is essential. Thoughtful education about healthy growth trajectories, paired with advice on optimal CFP, inclusive of the types of food and the manner in which they should be fed, may be a promising way forward. Awareness of the evidence and feasible strategies fosters timely identification of at-risk families and concise points to present to all patients. 

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