




Positive parenting approaches and their association with child eating and weight: A narrative review from infancy to adolescence

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Funding information

National Institute of Diabetes and Digestive and Kidney Diseases, Grant/Award Number: K01 DK120778

Summary

Parents play a critical role in the development of children's eating behaviours and weight status, serving as providers, models and regulators of the food environment. Many research reviews have focused on the robust body of evidence on coercive control in feeding: how parenting practices such as restriction and pressure to eat increase children's risk for developing undesirable eating behaviours and unhealthy weight outcomes. Fewer reviews adopt a strengths-based perspective focusing on the ways that parents can actively support the development of healthy eating behaviours and weight trajectories. Emerging research on such positive parenting styles and practices offers solutions beyond the avoidance of coercive control, as well as opportunities to highlight parallels between research on food parenting and the broader, well-established developmental literature on positive parenting. The focus of this review is to summarize what is known regarding benefits of positive parenting styles and practices for child eating and weight outcomes and discuss recommendations for future research. Current evidence supports starting with responsive feeding and parenting during infancy and incorporating structure and limit setting in early childhood, with monitoring and mealtime structure remaining important during middle childhood and adolescence. Areas for future research include: (1) further examination of the implications of identified food parenting practices and styles among diverse groups and caregivers; (2) increased consideration of child factors (eg, temperament) as moderators or mediators; and (3) further clarification of the relationship between general parenting and food parenting.

KEYWORDS

adolescence, childhood, infancy, parent feeding, positive parenting

1 | INTRODUCTION

Currently, 18.5% of children in the United States ages 2 to 19 years have obesity, with prevalence differing by race and socioeconomic status (SES).¹ While obesity is a multifactorial disease, parents have a substantial influence on child weight status.² In fact, parent weight

status remains one of the most robust predictors of child weight status.³ In addition to their genetic contribution, parents play a critical role in the development and maintenance of children's weight outcomes as well as their eating behaviours by shaping the eating environment⁴ through several roles.⁵ Parents control home food availability (eg, buying food, controlling access to food, preparing

food), serve as role models, adopt feeding styles that set the overall emotional climate related to feeding and use goal-directed feeding practices to shape the types and amounts of food their children consume.⁵

A critical question when considering the substantial influences of parents on children's eating and weight outcomes is: on which aspects of parenting should we focus? Many research reviews have focused on the robust body of evidence on coercive control in feeding: how parent feeding practices such as restriction and pressure to eat increase children's risk for developing undesirable eating behaviours and unhealthy weight outcomes.⁵⁻⁷ Fewer reviews adopt a strengths-based perspective focusing exclusively on the ways that parents can actively support the development of healthy eating behaviours and weight trajectories. Emerging research on such parenting styles and practices offers solutions beyond the avoidance of coercive control, as well as opportunities to highlight parallels between research on food parenting and the broader, well-established developmental literature on positive parenting.

As literature linking parenting with eating and weight has grown, disagreement in the identification, definition and measurement of key constructs has become evident. A food parenting working group was formed to address these issues, and in 2013, the working group published their consensus report, which included the identification and definition of three separate constructs—general parenting styles, feeding styles and food parenting practices.⁸ General parenting styles reflect parent-child interactions across all domains, whereas feeding styles reflect parent-child interactions specific to the feeding domain. Both general parenting styles and feeding styles are assessed by examining parents' demandingness and responsiveness. Demandingness is defined as behavioural control and monitoring (ie, structure and limit setting), and responsiveness is defined as warmth and awareness of a child's specific needs and requests to help foster autonomy.⁹ Feeding styles describe the degree to which a parent's approach reflects demandingness and responsiveness within feeding contexts.¹⁰ Within research on general parenting styles and feeding styles, these dimensions are often used to classify parents into one of four general parenting/feeding styles: authoritative (high demandingness, high responsiveness), authoritarian (high demandingness, low responsiveness), permissive/indulgent (low demandingness, high responsiveness) and neglectful (low demandingness, low responsiveness).^{10,11}

By contrast to the overarching nature of general parenting and feeding styles, food parenting practices include specific behaviours that parents use when feeding their child. Food parenting practices are goal-oriented behaviours used in the context of feeding that reflect overarching constructs of coercive control, structure and autonomy support.⁷ Some researchers have argued that general parenting styles should be conceptualized as contextual moderators of the impact of specific parenting practices, both in and outside the feeding domain.^{12,13} Parents' food parenting practices, such as limit setting, may be more likely to be successful and predict healthier outcomes in the context of a generally authoritative parenting style that couples demandingness and responsiveness. However, application of this idea in the realm of food parenting is newer, and research is limited.

The most commonly used food parenting constructs are outlined in Table 1. In this review, we use the term food parenting to encompass both feeding styles and food parenting practices. We focus on positive general and food parenting constructs, using 'positive' to refer to general parenting styles, feeding styles and food parenting practices that are developmentally appropriate and contribute to an effective balance between parental demandingness and responsiveness. This parallels terminology used in the developmental psychology literature, in which there is a robust evidence base on 'positive parenting' approaches that promote adaptive child outcomes more broadly.¹⁴ Looking to the developmental literature can move child feeding research forward. A focus on positive parenting is one way to do this and builds upon prior influences of the developmental literature on the understanding of child feeding, such as in the realm of measurement.

Given that the early food parenting literature sought to elucidate effects of coercive control such as pressure to eat and restriction, it is not surprising that first generation of measures of food parenting, such as the Child Feeding Questionnaire (CFQ),¹⁵ the Comprehensive Feeding Practices Questionnaire,¹⁶ and the Infant Feeding Style Questionnaire,¹⁷ typically focused on these negative aspects of feeding (eg, pressure to eat, restriction). More recently, new survey instruments such as the Structure and Control in Parent Feeding¹⁸ and the Food Parenting Inventory¹⁹ have been developed that expand upon classic measures by allowing measurement of other potentially more supportive aspects of control in parent feeding, such as structure and limit setting,²⁰ as well as practices that provide support for children's autonomy in eating, including responsiveness to children's hunger and fullness. This development follows the differentiation among types of parental control in the broader parenting literature.²¹ These refined child feeding measures provide opportunities to deepen our understanding of these more positive aspects of food parenting.

The focus of this narrative review is to use strengths-based and developmental perspectives to examine associations between the use of positive parenting styles and practices and child eating and weight outcomes from infancy to adolescence, and to offer directions for future research. While decades of research in developmental sciences illustrate that the parent-child relationship in the feeding domain is bidirectional, with the parent influencing the child's behaviour and the child influencing the parent's behaviour,²² we focus primarily on parent contributions—both general and food-specific—in the current review. Figure 1 presents central dimensions of positive food parenting from infancy to adolescence that support the development of healthy eating behaviours and weight outcomes. Across development, there is a need for both parental demandingness (eg, structure and limit-setting, monitoring) and responsiveness (eg, autonomy support, encouragement). However, the expression of each changes as the child's needs and abilities change. We propose that exposure to positive parenting styles and practices—both general and food-specific—can shape children's food preferences and acceptance, responsiveness to hunger and satiation, healthy eating behaviours and intake of nutrient-dense foods over time. These child factors may, in turn, confer protection from obesity. In addition, given that behaviour change

TABLE 1 Definitions and examples of feeding styles and food parenting practices

Construct		Definitions and examples
Positive feeding styles		
<i>Refer to child-centred, responsive feeding styles, in which parents provide a high degree of structure, guidance, respect for children's autonomy over their eating and promotion of independence in eating</i>		
Authoritative style		High demandingness, high responsiveness; high degree of involvement, structure and control, high child autonomy support responsiveness *During early infancy (ie, the first 4-6 months postpartum when the infant is exclusively mild-fed) infancy, a style high in responsiveness and low in demandingness is appropriate
Positive food parenting practices		
<i>Include a set of practices high in structure and autonomy support which have been shown to support children's food acceptance, awareness of hunger and fullness cues (appetite regulation), nutrition knowledge, healthy food choices and diet quality</i>		
Structure	Monitoring and engagement	Provides age-appropriate monitoring of the child's eating and food purchasing behaviours; offers guided choices at meals and snacks; offers appropriate portion sizes; allows child to make contribute ideas for meals and snacks
	Rules and limit setting	Places reasonable limits on the child's intake and purchase of unhealthy foods; conveys expectations regarding mealtimes and participation in family meals; limits frequent snacking
	Establishes routines	Establishes feeding routines; provides developmentally appropriate feeding environment; provides opportunities for regular family meals; offer meals and snacks at consistent times
	Provision of healthy foods	Introduces a variety of healthful foods to child; makes healthy foods available and accessible at meals and snacks
	Covert control	Controls a child's food intake in ways that are less obvious to the child (eg, not purchasing unhealthy foods or avoiding unhealthy restaurants)
Autonomy support	Responsiveness to cues	Awareness and respect for child's hunger and fullness cues; terminates feeding/no longer offers food in response to fullness cues; does not pressure child to eat; does not demand that children clean their plates
	Praise and encouragement	Praises child's efforts for trying new foods or eating specific foods; encourages children to try new foods, without coercion; encourages children to develop more autonomy over eating (meal preparation, food shopping) and applauds efforts
	Social modelling	Uses own behaviour, knowledge and values to influence child's eating; provides opportunities for child to learn about healthy eating; involves child in food preparation, food preparation and food shopping; provides knowledge about nutrition and health; models a preference/liking for healthy foods
Negative feeding styles		
<i>Refer to parent-centred, coercive and unstructured feeding styles related to either a controlling or permissive general parenting style, in which parents place too many or too little demands on children's self-regulation and behaviour, and enforce too much or too little control over children's eating in ways that undermine food acceptance and appetite regulation</i>		
Authoritarian		High demandingness, low responsiveness; high control, low support for child autonomy in eating
Permissive/indulgent		Low demandingness, high responsiveness; low control, high support for child autonomy in eating
Uninvolved		Low demandingness, low responsiveness; lack of support, structure and control
Negative food parenting practices		
<i>Include a set of practices that are high in coercive control and low in structure which have been shown to undermine children's autonomy over their eating, and pose risk for the development of problematic eating behaviours and poor diet quality</i>		
Coercive control	Overt control	Controls the child's intake in a way that is more obvious to the child (eg, strict rules regarding what and how much the child should eat); controls the amount and types of foods the child is offered
	Restriction	Restricts the child's access to or intake of certain foods, often energy-dense foods; keeps certain foods out of reach or hidden
	Intrusive monitoring	Monitors the types and amounts of food that the child consumes in ways that correspond to overt control; keeps track of the child's intake of certain foods (sweets, snacks, high-fat)
	Pressure	Pressures the child to consume more food and specific foods (eg, vegetables); demands that the child clean his/her plate

(Continues)

TABLE 1 (Continued)

Construct		Definitions and examples
	Emotional feeding	Offers food in response to the child's negative emotions or distress; uses food to soothe or combat boredom
	Instrumental feeding	Uses food as a reward, or withholds food as a punishment; uses bribes and threats to influence the child's eating
Unstructured	Neglect	Abdicates responsibility in feeding; lacks involvement and oversight for children's eating; unaware of what, how much or how often child is eating (low monitoring and engagement); limits availability of nutrient-dense foods; lacks consistency in meal and snack times and routines
	Indulgence	Allows child complete control over eating; inconsistent mealtimes, allows child to eat/snack frequently and at will; provides large/unlimited portion sizes; provides unlimited availability of low-nutrient dense foods and low availability of nutrient-dense foods; acts as a short-order cook; does not monitor child's food purchases

Notes: Definitions and examples of feeding styles and food parenting practices were adapted from Vaughn et al.,⁷ and align with general parenting practices described by Maccoby and Martin,¹¹ and applied to the feeding domain by Hughes and colleagues.¹⁰ Within positive feeding styles and food parenting practices, structure aligns with demandingness and autonomy support aligns with responsiveness. Within negative feeding styles and food parenting practices, coercive control aligns with high demandingness and low responsiveness. Unstructured practices are low in demandingness; neglect is also low in responsiveness, while indulgence is high in responsiveness.

Source: Adapted from Vaughn et al.⁷

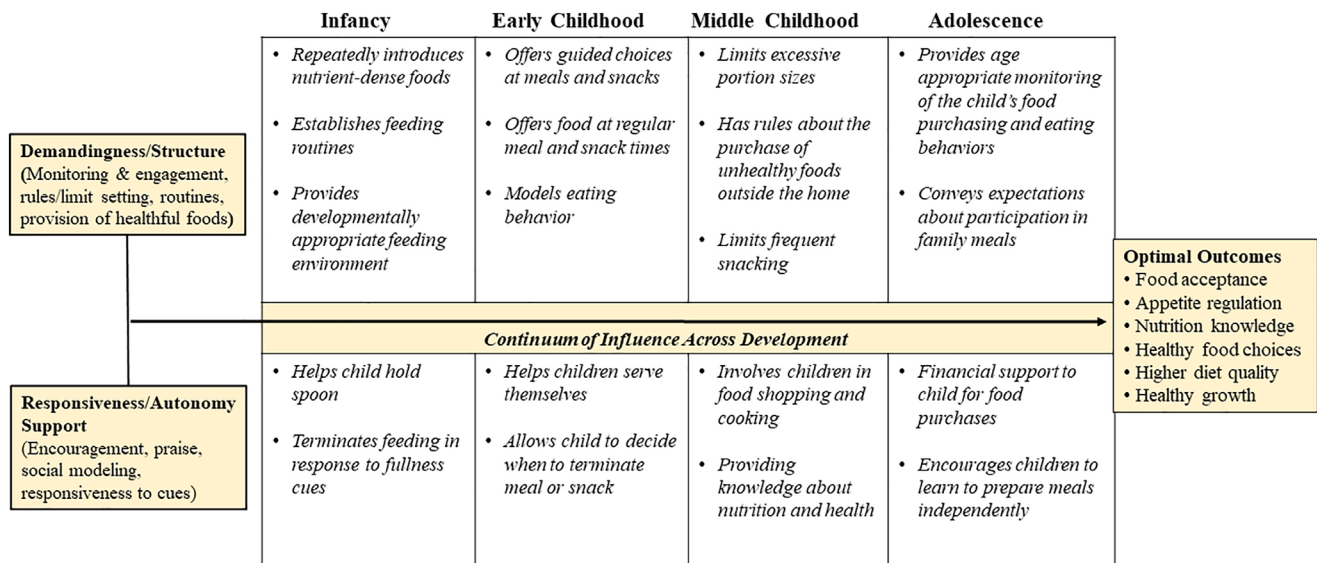


FIGURE 1 Parental demandingness/structure and responsive/autonomy support are critical at every developmental stage (ie, there is a continuum of influence). Examples of developmentally appropriate positive food parenting practices reflecting overarching dimensions of demandingness/structure and responsiveness/autonomy support. Examples are illustrative and neither exhaustive nor limited to a particular stage. There may be cumulative impact of parenting, such that parenting at early developmental stages may continue to impact children at later developmental stages

precedes weight gain, it may be that positive behaviour change (eg, increases in fruit and vegetables, decreases in sugar-sweetened beverage consumption) is observed without any weight change in the short term, but rather the attainment of optimal weight observed over the long term. As such, we focus on both eating and weight outcomes. Following the discussion of links between general and food parenting and these outcomes in each developmental stage, directions for future research are presented.

2 | METHODS

Authors with expertise in each developmental period under consideration (infancy: AKV; early childhood: SAF; middle childhood: LAF; adolescence: KNB) developed the initial draft of the corresponding section. These authors reviewed seminal and recent review articles and perspectives and also identified relevant empirical articles with rigorous designs. For example, in drafting the early childhood section, recent

and key reviews and perspectives on food parenting in early childhood were reviewed^{7,23,24} and given the availability of studies with rigorous designs during this stage of development, the author of this section focused on longitudinal studies that included observational measures of parenting constructs and subsequent eating and/or weight outcomes, as well as randomized studies of general parenting interventions as described below. Because the extant research and parenting considerations differ by developmental period, this approach allows us to represent and articulate these differences. The writing team reviewed and refined each other's sections, allowing for a consensus about the definition and organization of constructs, key take-home points and areas for future research across developmental periods.

As noted in other key narrative reviews in the field⁷, there are strengths and limitations to such an approach. This work is not a systematic review and should not be interpreted as such. However, we would argue that there is value in bringing together a diverse team of content experts and arriving at a consensus about the state of the field and directions for future research. In addition, general and food parenting are often studied separately, and the present review uses the concept of 'positive parenting' from the developmental sciences to bring together constructs such as authoritative parenting styles, authoritative feeding styles, structure and autonomy supportive practices. We argue that there is much to be learned from the decades of successful parenting research in the developmental sciences, and as such, we also discuss available evidence regarding how evidence-based general positive parenting interventions might impact child eating and weight status. We also apply developmental perspectives to illustrate how central dimensions of feeding styles and practices change with developmental stage, communicating which components of responsiveness and/or demandingness become particularly relevant with each new developmental period.

3 | INFANCY

When considering Maccoby and Martin's parenting framework,¹¹ the dimension that is most relevant during infancy is parental responsiveness. A primary goal of early feeding interactions should be to support the infant's developing abilities to self-regulate within feeding and eating contexts. Previous research suggests infants exhibit some evidence of intake regulation in response to growth needs from birth.²⁵ However, this compensation is only partial in the first few months postpartum, improving across the first year and as the infant matures,²⁶ with evidence of subsequent decline in eating self-regulation by 15 months of age,²⁷ though there is likely individual variation in this timeline.

Optimal feeding styles and food parenting practices during infancy ensure the infant is fed in a way that preserves and promotes his or her developing capacities to self-regulate (see Figure 1). To this end, current recommendations focus on promoting responsive food parenting, defined within this developmental period as feeding styles and food parenting practices that are infant-led and responsive to infant cues^{23,28} across all modes of infant feeding (eg, breastfeeding,

bottle feeding, introduction of complementary foods). During the period of exclusive milk feeding (for the first 4-6 months), a caregiver engaging in responsive feeding is attentive to the infant's cues. The caregiver only offers the breast or bottle and engages the infant when s/he is receptive and also allows the infant to disengage or take breaks as needed. Thus, the caregiver paces the feeding, as well as the social interaction that occurs during the feeding, in response to infant cues. The caregiver may gently prompt the infant to eat, especially during the introduction of complementary foods and beverages when the infant is exposed to novel foods, but the caregiver withdraws if the infant refuses or shows clear disengagement cues and refrains from using coercion or force to encourage the infant to eat.

During early feeding, potential bidirectional influences between feeding mode (at the breast vs via a bottle) and food parenting styles and practices are important to consider; caregivers' food parenting styles and practices likely influence feeding choices, but feeding mode may also influence food parenting styles and practices. There is some evidence that mothers who initially exhibit greater levels of sensitivity to their infants are more likely to initiate breastfeeding and have longer breastfeeding durations.^{29,30} Moreover, studies comparing feeding interactions of breastfeeding and bottle-feeding dyads during early infancy demonstrate breastfeeding mothers exhibit more warmth, sensitivity to infant cues and behavioural synchrony during infant feeding compared with bottle-feeding mothers.³¹ However, the experience of breastfeeding may also promote responsive feeding because, to a certain extent, successful breastfeeding is inherently infant-led, requiring the infant to play an active role in initiating the feeding by signalling hunger and effectively latching onto the breast, and maintaining the feeding by sustaining proper positioning, suction and nutritive sucking.³² In addition, because the breastfeeding mother cannot readily assess the amount consumed by the infant at the breast, she must learn her infants' cues and behaviours to decide when to terminate the feed and whether the infant is satiated. Longitudinal studies consistently demonstrate that longer durations of breastfeeding are associated with self-reports of higher responsive feeding practices and styles, greater use of structure-related food parenting practices during complementary-food feedings and lower pressuring feeding styles during later childhood.³¹ Although the largely correlational nature of this evidence precludes the ability to disentangle potential bidirectional effects and confounders, it is possible that mothers with greater propensity toward responsive feeding are more likely to breastfeed and that the experience of breastfeeding further promotes use of responsive food parenting practices and styles.

By contrast, mothers who report more controlling feeding practices at birth are more likely to formula-feed,²⁹ perhaps because bottle-feeding affords the caregiver more control over the feeding and assurance about how much the child has consumed.^{32,33} The caregiver can exert more control over the initiation or pacing of the feed by pushing the nipple into the infant's mouth or positioning the bottle in a way that increases milk flow and reduces the amount of infant effort exerted. When using clear bottles, caregivers have more information about how much expressed breast milk or formula is

offered and consumed and thus may be less reliant on infant cues and behaviours to decide when to terminate the feeding. This may lead to overfeeding and poorer infant self-regulation of intake if the caregiver encourages the infant to consume more milk than needed. However, bottle-feeding does not lead to overfeeding for all dyads as greater levels of responsive feeding are associated with lower intakes during bottle-feeding.³⁴ Recent experimental research illustrates that, in the short term, replacing conventional, clear bottles with opaque, weighted bottles promotes maternal sensitivity to infant cues and helps mothers feed their infants less expressed breast milk or formula at a slower rate.³⁵ Thus, strategies to promote responsive feeding during bottle-feeding may help reduce risk for overfeeding and excess weight gain during infancy, and offer the potential to reach vulnerable families who are more likely to bottle-feed formula given contextual barriers to breast-feeding (eg, need to return to work, lack of resources such as time and supplies for using a breast pump or maternal obesity that are associated with lactation challenges³⁶).

During the introduction to complementary foods and beverages, responsive feeding remains important for supporting infant self-regulation of intake while also promoting preferences for nutrient-dense foods.²⁸ Because this developmental period is characterized by significant oral-motor development³⁷ and a rapid transition in the child's dietary exposures, components of responsive feeding expand to include feeding practices that are infant-led, while guiding the infant to accept and enjoy a wide array of nutrient-dense foods. As humans are predisposed to prefer sweet, umami and salty tastes over bitter and sour, preferences for novel flavours and foods develop via learning, including: (1) repeated exposure, wherein foods are repeatedly offered to and consumed by the child, increasing their familiarity; (2) associative conditioning, wherein a novel food is paired with a familiar, already preferred food or with a positive social context; and (3) social modelling, wherein the child observes parents, siblings or peers consume and enjoy the food.³⁸

Baby-led weaning (BLW) is a less commonly used approach to the introduction to complementary foods. At the heart of BLW is the concept of infant self-feeding and autonomy. In strict BLW, infants self-feed only finger foods, whereas other adaptations of BLW allow for the infant to self-feed using utensils and pureed food. This emphasis on self-feeding is congruent with responsive feeding, including the ideas that: (1) the infant should be provided the autonomy to explore novel foods by him or herself and at his or her own pace and (2) the infant's initial rejection of novel foods is reframed within the context of trusting the child to eat when he or she is ready with repeated exposure. Within BLW, parents wait to introduce complementary foods and beverages until their infant exhibits developmental signs of readiness to self-feed (ie, ability to sit-up unsupported, with good head and neck control), which generally occurs around 6 months of age. While BLW is increasing in popularity, research on this approach is limited and is confounded by the fact that many children who primarily self-feed may also be spoon-fed to some extent by caregivers.³⁹ Some evidence for potential benefits of BLW on infant eating outcomes (such as improved satiety responsiveness in later toddlerhood⁴⁰) exists, as well as evidence that BLW may have other

benefits for the family, such as lower maternal anxiety related to feeding.⁴¹ Findings on implications for weight outcomes are mixed.^{40,42} Given that 4 to 6 months may be a sensitive period for food and flavour learning⁴³ as well as an important time for early and frequent consumption of foods for allergy prevention,⁴⁴ delaying introduction of complementary foods until an infant displays all of the necessary readiness signs of BLW may have some downsides. Thus, more research on this approach and its congruence with responsive feeding and healthy eating and weight outcomes is warranted. Notably, BLW was included in the recent National Academies of Sciences, Engineering and Medicine expert report on feeding infants and children from birth to 24 months as a research gap in the infant feeding domain.⁴⁵

Taken together, support for infant self-regulation of intake through responsive feeding and parenting comprise an important foundation for supporting healthy weight gain trajectories during early infancy.⁴⁶ Indeed, randomized controlled trials illustrate that promoting responsive feeding and parenting styles and practices promotes healthy weight gain trajectories during infancy and lower risk for overweight during infancy and early childhood.⁴⁷ The promotion of responsive parenting beyond the feeding domain during this period may further support healthy eating and weight,^{48,49} which highlights an opportunity for further integration between the developmental and obesity sciences.

4 | EARLY CHILDHOOD

As children move from infancy to early childhood, the demandingness dimension of Maccoby and Martin's framework¹¹ becomes increasingly relevant. It is recommended that parents continue responsiveness to child cues, coupling it with structure and limit setting to achieve a parenting style that is authoritative, rather than indulgent/permissive. As shown in Figure 1, this structure should be developmentally appropriate.

Emerging evidence shows that parental provision of structure predicts healthy eating and weight in young children. In a longitudinal study of 207 Australian families, reports of greater structure-related food parenting practices, including family meals and structured meal timing, at 2 and 3.7 years of age predicted lower food fussiness later in early childhood.⁵⁰ Findings from a large cohort study also support the importance of structure in the form of routines with positive outcomes across multiple domains: 3-year-old children who had regular bedtimes, mealtimes and screen-time limits had increased emotion regulation; and poor early childhood emotion regulation was predictive of obesity 8 years later.⁵¹ Yet in a prospective, longitudinal study assessing structure in feeding with mothers of 2- to 5-year-olds, mothers who rated children higher on satiety responsiveness at age 2 were more likely to report structured meal timing later in development, suggesting a potential bidirectional association between the child's ability to self-regulate intake and the family's propensity toward structured meals.

One possible mechanism linking structure and limit setting with eating and weight is that young children encountering fewer demands

on feeding may grow up in environments in which energy-dense salty and sweet foods are routinely available and accessible, though this still needs to be examined. Such foods correspond with children's genetic taste predispositions, making it likely that children would select them over healthier alternatives, potentially interfering with repeated exposures to nutrient-dense foods.³⁸ By contrast, incorporation of limit setting through approaches such as constrained or guided choices (in which the parent provides developmentally appropriate food and decides when it is time to eat while the child can self-serve and decide what and how much to eat) is an example of a feeding style that couples demandingness with responsiveness to the child's hunger, satiation and growing autonomy.⁷ Such approaches may also support children's development of self-regulation around eating.

The literature on general parenting styles corroborates the importance of parents' provision of structure and limits. Of the four styles from Maccoby and Martin's framework,¹¹ the indulgent/permissive style is most consistently linked with poorer dietary patterns and elevated weight status in early childhood,⁶ suggesting that in early childhood, responsiveness in the absence of demandingness confers risk for unhealthy eating and weight outcomes. In a longitudinal study combining observational and self-report measures of general parenting style, children experiencing a permissive/indulgent parenting style at age 4.5 years were most likely to be at risk for subsequent elevated weight outcomes.⁵² Evidence in support of causal pathways comes from an intervention promoting authoritative feeding styles within a sample of primarily Black, low-income mothers of preschoolers.⁵³ This intervention resulted in decreases in children's daily consumption of solid fats and added sugar and increases in authoritative parenting practices during a laboratory test meal.⁵³

In addition, there are several rigorously tested, evidence-based positive parenting training programs in early childhood that can provide insight as to how general parenting, eating and weight status may be linked. Studies of these general parenting interventions, which incorporate elements of demandingness and responsiveness, have strong internal validity supporting linkages between positive parenting and adaptive child outcomes, traditionally those in the socioemotional domain. Strategies promoted in these general parenting interventions include child-directed play; verbal responsiveness; allocating attention to positive behaviours and ignoring undesirable behaviour; and descriptive, task-oriented praise (eg, 'I really liked how you cleaned up your blocks when you were done playing').⁵⁴ Secondary data analyses reveal the potential of such general parenting interventions to impact weight over time. A randomized study using the Parent Program of the Incredible Years Series to promote parenting competence and child socioemotional development was conducted in a sample of low-income parents of preschoolers at high risk for conduct problems.⁵⁵ Findings included that intervention-group children had lower BMI z-scores than controls in middle childhood.⁵⁵ Similarly, at-risk children randomized to a ParentCorps intervention group during pre-Kindergarten had lower BMIs than controls at age 8 years,⁵⁵ and implementation of the Family Check-Up intervention during toddlerhood impacted children's BMI trajectories into middle childhood, with evidence of mediation by parents' positive behaviour support

(eg, structuring play periods, prompting and reinforcing positive behaviour) during toddlerhood.⁵⁶ By contrast, when implementing parent, child and classroom components of Incredible Years in an attempt to improve self-regulation and weight outcomes among preschoolers enrolled in Head Start, Lumeng et al⁵⁷ did not observe effects on preschoolers' weight outcomes. The authors noted that these null results may have been due to low parent participation in this trial, with another possibility being that effects on weight could emerge at a later time. Overall, these randomized studies of well-established general parenting interventions suggest the potential of general parenting styles to impact eating and weight through either direct effects or interactions with more proximal predictors like feeding practices. It is possible that impacts on weight may emerge when the child becomes even more autonomous and with the transition to school entry.

In sum, when considering implications of parenting during early childhood, there is evidence to support recommendations to: provide structure (such as a structured eating environment and consistent meal time routines), set limits (such as setting the range of nutrient-dense food options that are available) and incorporate both demandingness and responsiveness into general parenting, to support child development of healthy eating and weight.²⁴

5 | MIDDLE CHILDHOOD

Middle childhood refers to a time in which school-aged children are undergoing a period of tremendous growth in autonomy, identity development and perceived competence across various domains of development.^{58,59} With the transition to school comes newfound independence, giving children greater responsibility for *what, how much and whether* they eat, while ideally *when and where* children eat remains structured and fixed. Children's food preferences are likely well-established in middle childhood, and requests for energy-dense foods high in sugar, sodium and fat are often at odds with parents' desires for dietary variety and children's intake of nutrient-dense foods. Furthermore, self-regulatory capacity and appetitive traits become more established in middle childhood and give rise to more autonomous eating.⁶⁰ As such, parents' food parenting strategies should shift towards increasing support for children's autonomy with continued structure (eg, establishing rules regarding the purchase of unhealthy foods at school) and responsiveness (eg, increased child involvement in food shopping and cooking). As shown in Figure 1, with increasing independence in middle childhood, positive food parenting strategies encompass limit-setting and rules regarding food and eating (devoid of harsh psychological or behavioural control and monitoring), along with developmentally appropriate autonomy support, provision of ample opportunities for children to make their own choices, and inclusion of children in decisions about food and eating. With the shift towards increased child autonomy, parents may start to increase their monitoring (tracking and surveillance of child behaviour) of the child's food intake. Parental monitoring is important as it allows the parent to notice early signs of concerning behaviour and to make

adjustments accordingly, and monitoring has been consistently linked to positive child outcomes in the general parenting literature.⁶¹

Studies linking general parenting styles to obesity in middle childhood suggest that food parenting practices and other food- or eating-related factors may be potential mechanisms through which general parenting influences obesity risk.⁷ Research has provided evidence for lower rates of emotional eating behaviours in children with authoritative parents, and in children who rate their parent-child relationship as more positive.⁶¹ Burke et al⁶² measured dietary quality using the Healthy Eating Index in a low-income, food insecure sample of youth ages 9 to 15 years. An authoritative parenting style was associated with greater dietary quality, while authoritarian (controlling) and permissive (indulgent) parenting styles were associated with lower dietary quality. Likewise, findings from related studies showed that both controlling and permissive parenting styles were associated with lower fruit and vegetable consumption and greater consumption of sugar-sweetened beverages.^{63,64}

Relations between general parenting style and dietary intake and patterns may also be linked to the family mealtime environment. Family mealtimes have been shown to be an important context for family socialization and functioning.⁶⁵ Mealtimes provide an opportunity for transmission of family routines, values and customs related to food and eating, as well as an opportunity for parents to model healthy eating behaviours and dietary practices. Lopez and colleagues found that in parents of 8- to 12-year-old children, authoritative parenting was associated with the presence of more positive mealtime structural practices (eg, more frequent family dinners; less eating during television viewing) and reports of greater parent modelling of healthy eating behaviours (eg, child sees parent eating healthy snacks).⁶⁴

There also is evidence that feeding style has an impact on child weight. In a mixed-methods, cross-sectional study with 174 Mexican parents and their 8- to 10-year-old children,⁶⁶ parents' greater use of positive parental involvement practices (eg, monitoring intake, limiting high-calorie foods) was associated with lower child BMI, whereas restriction of children's intake was associated with increased child BMI. In a sample of recent immigrant mother-child dyads, a maternal feeding style categorized as having a low demandingness/high responsiveness feeding style (ie, permissive feeding style) was associated with a higher child weight status.⁶⁷

Findings from studies linking feeding styles and food parenting practices to children's dietary intake and quality are mixed. In a study with 99 rural parents and their children (average age = 9 years), a permissive feeding style was associated with greater energy intake in children, while parents with an authoritative feeding style had children with lower intakes of energy-dense foods.⁶⁸ In a longitudinal study with more than 1200 parent-child dyads in the Netherlands, the authors measured parents' overt control (eg, deciding how many snacks the child should have), and covert control (eg, avoiding buying unhealthy foods) and their relation to weight- and eating-related outcomes in 9-year-olds.⁶⁹ Greater use of both forms of control was associated with decreased energy-dense snacking and intake of sugar-sweetened beverages, and covert control was related to increased fruit consumption. Moreover, this study provides some

evidence that general parenting may moderate the relationship between food parenting and child outcome. Covert control was related to increases in BMI over a 1-year period in children with parents who reported using a high degree of psychological control (eg, guilt/shame).

Taken together, authoritative parenting styles and positive food parenting strategies, such as involving children in food preparation and cooking and setting limits on food purchased outside the home, are associated with better eating-, dietary- and weight-related outcomes in school-age children. Mixed findings across studies may be due to differences in measures used to assess food parenting practices or styles, differences in diversity or composition of study population, differences in the assessment of general parenting and/or to the bidirectional nature of parent-child interactions. A small body of work exists that illustrates positive general parenting interventions in early childhood have effects on child weight status during middle childhood⁵⁶; future research should examine the impact of this intervention on parenting during middle childhood. Given the continued emergence of autonomy during this developmental period, parents are encouraged to provide more opportunities for children to develop the skills needed to make healthy decisions about food and eating when parents are not present, such as at school and in other settings in which independent eating occurs. With the transition from middle childhood to preadolescence to adolescence, and changing roles of food and eating, a distinct shift in parenting in the eating domain is likely to occur.

6 | ADOLESCENCE

Adolescence is a developmental time period marked by both increasing autonomy and decreased parental influence as children begin spending more independent time with peers. As such, the expression of demandingness and responsiveness shifts as children enter into adolescence. Regarding demandingness, parental use of structure and limit setting continues to be important. With respect to responsiveness, parenting that adjusts to the adolescent's need for increased autonomy can foster the successful development of independence,^{70,71} enhance parent-child communication,⁷² and may support adolescents' learning and development of healthful eating (see Figure 1, for examples). Moreover, parental monitoring becomes increasingly important, especially given that parents have less control over structure and limit setting during adolescence due to the continued widening of the child's ecology (see Figure 1). Some discussion focuses on how and whether the nature of monitoring results in effective adoption of social norms and expectations by adolescents. In the developmental literature, Statin and Kerr⁷² suggest that monitoring (general, not food-specific) based in part upon knowledge derived from the adolescent, as opposed to heavy parental surveillance and control, may facilitate better adoption of prosocial behaviours. Whether and how this applies to healthy eating habits is, as yet, undetermined. In addition, there may be a curvilinear relationship between level of monitoring and child outcome; there is emerging evidence that a moderate level of monitoring results in the

most positive child outcomes among adolescents with overweight,⁷³ with relationships less clear among those of other weight statuses. Levels of monitoring that are too high (ie, controlling) can inhibit the adolescent's ability to develop autonomy. Moderate monitoring involves observance of child eating behaviours, paying attention to any concerning behaviours, and includes direct communication with the adolescent regarding eating choices and behaviours (in a way that is not shameful or judgmental, and then subsequently adjusting parenting accordingly). Moreover, it is likely that the most helpful level of monitoring for any given child will depend on a number of child characteristics, such as temperament, food responsiveness and obesity risk.

As part of their increasing independence and the diminution of parent control, adolescents often experience increased responsibilities, such as working a part-time job and spending increased time participating in extracurricular activities. Such activities often result in significant eating outside the family home. To this point, many adolescents decrease their time spent engaging in family meals and start consuming more convenience foods, partially explaining the average decline in overall diet quality from early childhood to adolescence.⁷⁴ Parents can help counter this decline in diet quality by continuing to provide nutrient-dense foods for their adolescents, though more research is needed to identify whether this approach translates into adoption by the adolescent and subsequent increases in dietary quality.

Cross-sectional studies suggest positive mealtime structure supports adolescents' development and maintenance of healthy eating and weight outcomes.⁷⁵⁻⁷⁷ Research by Berge et al⁷⁵ indicated a positive association between maternal and paternal authoritative parenting style and adolescent-reported family meal frequency. However, when results were examined longitudinally, the relationship only persisted with opposite-sex dyads (ie, mothers and sons, fathers and daughters). While the average family meal frequency often decreases during adolescence, parents can still engage in efforts to make family meals a priority, as there may still be protective benefits to eating together even if less frequently, as family meals have been cross-sectionally associated with lower obesity risk and increased diet quality and fruit and vegetable intake.^{76,77} Moreover, there is evidence that it is the quality, not quantity, of family meals during adolescence that has an impact on health outcomes.⁷⁸ However, these relationships need to be confirmed using longitudinal and intervention study designs,⁷⁹ which are limited to date and have not yet determined whether family meals are causally associated with positive outcomes or the mechanisms by which these effects may occur.

The small body of research examining the influence of general parenting style on adolescent weight status has provided mixed findings. One study by Berge et al⁸⁰ reported that an authoritative parenting style was associated with lower BMIs in both daughters and sons. Another study identified a unique relationship between parenting style and adolescent weight status. While adolescents of authoritative parents had higher BMI trajectories during adolescence, they had less steep increases in BMI as they transitioned into emerging adulthood.⁸¹ This finding indicates that the skills learned via an authoritative parenting style (eg, increased autonomy and independence that

supports adoption of healthy lifestyle behaviours) may be protective against excessive weight gain as children transition out of the family home. As such, it may be that the effects of parenting are not always immediate but may become pronounced during transition periods of increased autonomy. Moreover, there may also be differences based on the sex of the parent and adolescent in the dyad. In one study, maternal parenting style only was related to their adolescent son's, but not daughter's, BMI, with no relationship between paternal parenting style and adolescent BMI.⁸² Unlike the earlier developmental periods where evidence supports that general parenting interventions may have a positive impact on child eating and weight outcomes, limited studies have examined this in adolescence. There was an indirect effect of the Family Check-Up during adolescence (age 12-15) on weight status in young adulthood (age 22). The Family Check-Up increased parent-adolescent relationship quality, which reduced maladaptive eating attitudes, which reduced obesity risk.⁸³

Less work has examined how general parenting style is associated with adolescent eating behaviour. One study investigating the relationship between general parenting style and fruit consumption found that adolescents with an authoritative parent had the greatest fruit intake, followed by adolescents of indulgent parents, with adolescents of authoritarian and neglectful parents consuming the least fruit,⁸⁴ suggesting a benefit of high responsiveness. However, this finding needs to be replicated in other samples and with other eating- and nutrition-related variables of interest, using longitudinal and randomized study designs.

In sum, during adolescence, parents can continue efforts to focus on structuring the adolescent's food environment so that it is responsive to their child's needs (eg, provision of convenient nutrient-dense foods and being mindful of the availability in the home of foods that undermine healthful eating). Given the increased independence that marks adolescence, monitoring may be especially important during this time.

7 | DISCUSSION

Across all developmental periods, parents play a critical role in the development and maintenance of child eating behaviour and weight status. Parents act as key agents of socialization for children's eating behaviours through their roles as providers (ie, brings food into the home), models (ie, shows the child how to eat) and regulators (ie, decides what to purchase and serve, directs the child's behaviour). While the literature has traditionally focused on the impacts of coercive control in parent feeding on child eating and weight status, researchers have started to shift toward examination of more 'positive' facets of food parenting. We use 'positive' to refer to general parenting styles, feeding styles and food parenting practices that are developmentally appropriate and contribute to an effective balance between parental demandingness and responsiveness. This parallels terminology used in the developmental psychology literature, in which there is a robust evidence base on 'positive parenting' approaches that promote adaptive child outcomes more broadly.¹⁴ We aimed to build

upon this history, adopting a strengths-based perspective in considering ways that parents can actively support the development of healthy eating behaviours and weight trajectories, and incorporating learnings from evidence-based general parenting interventions alongside our consideration of food parenting. While there is evidence in support of many of the positive practices and styles highlighted in Table 1, many opportunities remain to build upon the extant research and expand the extent to which we can leverage what is known about positive parenting to promote healthy child outcomes across various periods of child development and sociodemographic groups.

In addition to evidence within specific developmental periods, findings from the few longitudinal studies spanning developmental periods indicate that general parenting style in early life may have implications for future child weight status. For example, high maternal sensitivity during the first 3 years of life appears to be protective against obesity at age 15 years.⁵¹ Other work indicates that interactions between parenting style and child self-regulation in early life have implications for weight status in adolescence.⁸⁵ Among boys with poorer abilities to delay gratification at age 4, having a mother with an authoritarian parenting style increased risk for an elevated weight status at age 15. Hence, the influence of early parenting on child eating and weight outcomes may not be observed until later in development, emphasizing the need for more longitudinal studies that measure parenting, potential mediators and weight status across developmental stages. In particular, many of the studies on parenting and eating/weight outcomes during middle childhood and adolescence are cross-sectional, precluding the ability to draw conclusions about the bidirectional parent-child feeding relationship. Future research in this area should continue to move toward examining directionality and causality in the context of longitudinal, experimental and interventional designs, which are critical to clarify the interplay of parenting styles, feeding styles, food parenting practices and child outcomes. Moreover, rigorous operationalization of the bidirectional nature of the parent-child relationship is needed, as well as operationalization and investigation of positive parenting constructs and eating behaviours that may mediate links between parenting and weight. As such, there is a need to continue to develop and invest in experimental and objective measures of eating behaviour so that research does not rely mostly on parent- and self-reported dietary intake. Another measurement issue that the field will need to address is the paucity of measures that are developmentally appropriate across several age groups, allowing for comparison over time. It is also recommended that future research prioritize use of observational measures of parenting, with a consideration of the appropriateness and validity of these and other measures in diverse contexts, as described below.

Other potential areas of focus for future research are to build the evidence base in areas in which the evidence is more limited (see Table 2). More recently, a movement in the field to study food parenting and general parenting together has been initiated,⁸⁶⁻⁸⁸ which may help clarify relationships between the two. General parenting may serve as a moderator or mediator of the impact of food parenting on weight and eating behaviours. Alternatively, for some groups differing

in sex, gender, SES and race/ethnicity, there might be direct effects of parenting style, whereas for others parenting style might moderate impacts of specific practices. To further elucidate the role of general parenting styles, food parenting research could also leverage knowledge learned from developmental science. Interventions targeting general parenting (eg, parental warmth and sensitivity, limit setting, autonomy support) have been shown to be efficacious in reducing children's BMI and weight-related eating and activity behaviours⁸⁹ with potential effects extending into adulthood.⁹⁰ Future research is needed to better understand the interplay between general parenting styles and specific food parenting practices during childhood, including studies of families from various sociodemographic and cultural backgrounds, given some evidence that SES and race/ethnicity may moderate impacts of parenting style on weight.⁹¹

In addition, other potential moderators of the impact of parenting on child eating and weight include child temperament and appetitive traits. These child factors can be examined as potential moderators in analyses or can be considered in the implementation of interventions (ie, tailoring interventions to child characteristics). During infancy, interventions have been developed that promote responsive parenting to all participating families, regardless of variability in factors such as child cues or temperament. Yet this variability is acknowledged within the intervention approach itself by teaching about temperament, giving examples of child hunger/fullness cues and demonstrating responses to these cues in the moment with the target child.⁹² This positive parenting intervention has led to improvements in both infant dietary patterns⁴⁹ and weight status which have persisted into early childhood.⁴⁸ Moreover, this intervention also resulted in greater maternal use of responsive food parenting.⁹³

SES and cultural influences may play a large role in feeding but have largely either not been captured or are confounded in past research. Furthermore, while there are an increasing number of studies in underrepresented and under-resourced populations, the majority of evidence to date is based on predominantly white and well-resourced samples. Mixed findings in the extant literature may be driven, in part, by the failure to reflect cultural and socioeconomic diversity. This issue likely also impacts the sensitivity of existing measurement tools to these influences. Work in low-income Black and Hispanic samples has reported poor fit when testing for factorial invariance with common measures of parent feeding practices,^{94,95} suggesting that further clarification of the cultural appropriateness and relevance of these measures should be undertaken. Furthermore, the experience of food insecurity and/or low SES may alter food availability, which may influence feeding style or food parenting practices in a way that cannot be captured with most existing measurement tools. Three notable exceptions to this are the Caregiver Feeding Styles Questionnaire,¹⁰ which was developed for use with low-income minority parents, the Parenting around SNacking Questionnaire,⁹⁶ which was developed using qualitative studies with low-income White, Black and Hispanic mothers of preschoolers, and the Infant Feeding Styles Questionnaire, which was developed for use with low-income Black mothers.¹⁷ In addition, researchers are beginning to examine the effectiveness of parenting interventions in more diverse

TABLE 2 Recommendations for future research on positive food parenting

1. <i>Improve measurement of key constructs</i>	
1a.	Operationalize and investigate positive food parenting constructs (eg, structure and limit setting) via observational assessments
1b.	Develop additional objective measures of child eating behaviour
1c.	Develop measures that are developmentally appropriate across several age groups, allowing for comparison over time
1d.	Evaluate the cultural appropriateness and relevance of measures in diverse populations
1e.	Validate measures of positive food parenting and child eating behaviour in diverse populations
2. <i>Expand research on understudied aspects of positive food parenting</i>	
2a.	Examine possible associations between weaning approaches (eg, baby-led weaning) and eating and weight outcomes during infancy
2b.	Better understand the nature and role of parental monitoring in promoting healthy eating behaviours during middle childhood and adolescence
2c.	Determine, through longitudinal and intervention studies, whether family meals are causally associated with positive child eating and weight outcomes during early childhood, middle childhood and adolescence
2d.	Expand the body of research examining impacts of positive food parenting and general parenting on eating behaviours and weight status during middle childhood and adolescence
2e.	Across all developmental periods, increase the number of studies that include (or exclusively focus on) fathers and other non-maternal caregivers, single parents and same-gender parents
3. <i>Conduct longitudinal research to understand stability vs Change in positive food parenting across development</i>	
3a.	Understand stability vs change in caregivers' feeding practices and styles across early feeding modes, including breastfeeding, bottle-feeding and introduction to complementary foods
3b.	Understand stability vs change in feeding practices and styles across infancy, early childhood, middle childhood and adolescence
3c.	Identify potential predictors and impacts of stability vs change in feeding practices and styles across development
4. <i>Employ longitudinal and experimental designs to understand bidirectional associations and causality</i>	
4a.	Across all developmental stages, examine directionality and causality in the context of longitudinal and interventional designs to clarify the bidirectional nature of the parent-child relationship within feeding and eating contexts
5. <i>Further examine possible mediators and moderators of effects of positive food parenting</i>	
5a.	Consider child temperament or appetitive traits as moderators or mediators of how parenting influences child eating and weight outcomes
5b.	Understand whether and how parental weight status mediates or moderates effects of parenting styles and practices
5c.	Incorporate measures of both food-specific parenting and general parenting to better understand how general parenting practices and styles may mediate or moderate effects of food-specific practices and styles on child feeding and weight outcomes
5d.	Examine the implications of positive parent practices and styles among diverse socioeconomic and racial/ethnic groups, single parents, same-gender parents and fathers
6. <i>Develop and evaluate evidence-based interventions to promote positive food parenting at specific developmental stages and across all stages</i>	
6a.	Identify evidence-based strategies for promoting responsive feeding among mothers and other caregivers (eg, fathers, day care providers) to infants
6b.	Examine the potential of existing positive parenting programs to improve children's and adolescents' eating- and weight-related outcomes
6c.	Develop and evaluate multifactorial interventions that blend the fields of developmental and obesity sciences to understand how to promote positive food parenting and healthy eating and weight-related outcomes

samples that may be at increased risk for developing obesity. Current work is investigating whether an adaptation of a responsive parenting intervention that was effective among a mostly white population can prevent rapid infant weight gain among first-time Black parents.⁹⁷ However, much more additional research is needed in diverse samples to elucidate the relationships between race, SES, general parenting, food parenting and child eating and weight outcomes.

Another overarching challenge within the field of food parenting research is the underrepresentation of fathers.⁹⁸ While half of published studies in food parenting research have included fathers, most

data from these studies have been reported by the mother, with fathers making up only 17% of study participants.⁹⁸ There are a variety of reasons for this, including that mothers are more likely the primary caregiver and able to attend research visits, and that mothers are often in charge, or perceived to be in charge, of child feeding. However, given that there may be gender-specific associations of parenting on child eating and weight outcomes,⁸² and that multiple primary caregivers can influence the child's weight status,⁹⁹ it is vital to collect data on both caregivers in dual-parent households to help elucidate the relationship between food parenting and child eating

and weight outcomes. In addition, given the known relationship between parental and child weight status,² it is critical to collect and include both paternal and maternal child weight status when examining associations between parenting and child weight status. Moreover, there is paucity of research among single parents or same-gender parents.

In conclusion, research supports the use of general parenting styles, feeding styles and food parenting practices that are high in both responsiveness and demandingness, with benefits seen for both eating behaviour and weight status across the developmental spectrum. While promotion of early positive parenting shows promise, controlling practices are a common well-intentioned response to concern about actual or perceived obesity risk.⁵ Parents will likely need tools and resources to replace controlling parenting practices with positive parenting practices. Parents can benefit from anticipatory guidance on responsive feeding and the use of structure and limit setting early in the child's life to prevent the use of overt restriction and other controlling feeding practices. The existing evidence can inform continued development of related interventions and materials. Future research can build on current evidence by broadening the populations under study (eg, fathers, single parents, same gender parents, culturally and socioeconomically diverse samples), incorporating longitudinal follow-up and consideration of potential effect moderators, and leveraging intervention research, including well-established general parenting interventions from the developmental sciences, to bolster internal validity. Interdisciplinary collaboration between developmental and obesity sciences offers the potential to better understand how positive parenting may benefit both physical and socioemotional well-being and the mechanisms through which this might occur. Continuing to bolster the research in this area can further scientific understanding of how to help support parents and caregivers and promote healthier outcomes among populations at greatest risk.

ACKNOWLEDGEMENTS

The authors would like to thank Dr. Leann Birch for her invaluable mentorship. As a trailblazer in this field, much of the research cited here can be traced back to Leann's influence. Dr. Birch continues to be a source of inspiration for many researchers in this field, including the authorship team. The authors would also like to thank Dr. Madeleine Sigman-Grant for her critical feedback and Dr. Katherine Barrett for her helpful edits. This work was supported by K01 DK120778 (KNB).

CONFLICT OF INTEREST

The authors report no conflict of interest.

AUTHOR CONTRIBUTIONS

K.N.B., S.A.F., L.A.F. and A.K.V. conducted the literature search and wrote the article. J.O.F. drafted the conceptual model. J.O.F. and S.L.J. provided critical feedback. All authors contributed to editing the article and approved the final submission.

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