

REVIEW

Parental food communication and child eating behaviours: A systematic literature review

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Abstract

Aim: To review current evidence for parental food communication practices and their association with child eating behaviours.

Methods: The PRISMA framework guided the reporting of the review; registered with Prospero in July 2020. Eligible studies were critically appraised using the Joanna Briggs Institute tools. Only quantitative studies that included a parental measure of food communication and a child measure of eating behaviour were included.

Results: From 11 063 articles 23 were eligible for synthesis. The vast majority (82%) of studies used observational cross-sectional designs. Three involved observing parent-child dyads, with the remainder using questionnaires. Two quasi-experimental designs tested interventions and two randomised control trial were reported. The majority of measures assessing parental food communication were subscales of larger questionnaires. The Caregiver's Feeding Style Questionnaire (CFSQ) was the most direct and relevant measure of parental food communication. Findings of reviewed studies highlighted that "how" parents communicate about food appears to impact child eating behaviours. Using child-centred communication provided promising outcomes for positive child eating behaviours, while parental "diet" communication was found to be associated with poorer dietary outcomes in children.

Conclusions: Food communication research is in its infancy. However, evidence for the importance of parents' child-focused food communication is emerging, providing a focus for future research and interventions.

So What?: Given the gaps in our understanding about prevention of disordered eating, there is a significant opportunity to explore what food communication strategies may assist parents to communicate about food in a positive way.

KEYWORDS

children, disordered eating, eating behaviours, food communication, systematic review

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1 | INTRODUCTION

Disordered eating is a term that encompasses a range of unhealthy eating behaviours and cognitions which result in negative outcomes.¹ Understanding the modifiable risk factors associated with disordered eating is crucial to mitigate progression to clinical eating disorders. Eating behaviours are developed in early childhood² and therefore, the family eating environment represents the ideal context for promoting positive eating habits and reducing risk for disordered eating.

Family mealtimes can provide a range of benefits for children.³ Children from households where family meals occur with frequency, prioritisation and a positive atmosphere have reduced risk of disordered eating.^{4,5} In contrast, in families with high levels of weight talk and appearance teasing, poor family function (for girls), or low enjoyment (for boys), the protective function of family meals is reversed.⁶ Dallacker and colleagues' systematic review identified six individual components related to positive family mealtimes including parental role modelling of "healthy meals" and creating a positive atmosphere.⁷ Family meals appear to play a protective role against disordered eating for children, but only if particular environmental factors are promoted. The creation of a positive and supportive environment during mealtimes appears necessary for positive eating behaviours. Exactly which components make up such an environment, warrant exploration.

Interactions between parents and children regarding food and eating can be examined through the measurement of specific parental behaviours, or 'practices' that recur over time, and how these influence the health and wellbeing of the child.^{8,9} The strategies parents use are termed *Food Parenting Practices* (FPP) and many involve how parents communicate about food with their children.¹⁰ Parent *food communication* refers to the *specific verbal information that is relayed to children around food and eating*. When parents encourage dieting behaviours, through comments made about eating less to control weight, adolescent girls are more likely to develop disordered eating behaviors.¹¹ Conversely parental communication about health without reference to body weight, is associated with better child wellbeing.¹²

Parents may be unaware of the negative consequences their food communication can have on children.¹³ Research on family groups, found weight and lifestyle choices were discussed in a highly moralised way.¹³ For example, parents believed it was their job to tell children of the dangers of "fatness." Additionally, children reported parents used negatively framed messages and scare tactics when discussing eating habits. The authors highlighted these negative messages may lead to children focusing on their weight, or dieting, as opposed to more positive behaviors.¹³ Conceivably, if parents were aware of the impact of their words and were supported to adopt positive food communication strategies, this may have a powerful effect on engaging children in healthful eating behaviours and preventing disordered eating. Hence, parental food communication is a modifiable behaviour we believe is worth exploring, to then target in future preventive interventions.

Parental food communication, however, is a novel area of research with no structured review of the literature existing. In addition, the

current literature on FPPs does not define food communication as a single parenting strategy. Instead, parental food communication can be found within all three higher-order domains of Vaughn's FPP map¹⁰ (coercive control, autonomy support or promotion, and structure) and the specific strategies that lie within them (ie pushing to eat, encouragement around food choices, and setting mealtimes, respectively).^{10,14} As such, there is an important opportunity to explore parental food communication strategies and how they shape children's eating patterns. This information could then guide the future development of education resources for parents.

The aim of this systematic review was to identify and synthesise the current evidence for parental food communication practices and their association with eating behaviours in children (0-18 years).

2 | METHODS

This review was registered with PROSPERO in July 2020 (CRD42020201141) and was reported according to the Preferred Reporting Items for Systematic Review and Meta-analysis (PRISMA) guidelines.¹⁵ A literature search was completed using the following four databases: Medline (EBSCO), Scopus, PsychINFO and Web of Science, on August 1 2020. [Table S1](#) provides all search strings, including the keywords of "food communication" "parents" "child" and "eating" into all databases.

2.1 | Eligibility criteria

Studies were included in the synthesis when they met the following inclusion criteria: (1) Published in English, peer-reviewed journals between January 1990 and July 2020, (2) Examined food communication by a parent/caregiver toward a child (between 0 and 18 years), (3) Types of studies: randomised controlled trials, quasi-randomised, observational (cross-sectional, case-controlled study, cohort), (4) Family settings (homes), laboratory, individual interviews, shopping, healthcare, community centres, (5) Measure of "parental food communication practices" where at least 50% of the items are directly related to verbal food communication. Validated and non-validated tools were included, (6) Measure of child eating behaviours (eg dietary intake/patterns/restriction/quality) with validated or non-validated tools. Studies were excluded if they were conducted with children identified with specific co-morbidities (eg Autistic spectrum disorder) or they did not include parent and child data, the only measure of child outcome was BMI, or they were based in a school or kindergarten environment and therefore were not directly relevant to parents.

2.2 | Study selection, data collection, and synthesis

All articles identified across the four databases were uploaded to Endnote X9,¹⁶ then imported into Covidence¹⁷ where duplicates

were removed. Two reviewers used a standardised coding frame to screen articles for inclusion. First, an inter-rater reliability of >90% was established via both reviewers individually screening 100 random titles. LN and MD then separately performed title and abstract screening of all articles and disputes were resolved via discussion. Full text screening took place by two reviewers for each article to establish if it met the inclusion criteria. Common reasons for exclusion were ineligible outcomes (eg BMI was the only child outcome, or the parental measures did not contain equal or greater than 50% food communication items) and study design (eg qualitative).

The remaining 23 articles were reviewed, and characteristics were extracted into a predetermined spreadsheet by one reviewer (LN). Twelve percent ($n = 3$) of articles were randomly selected for a second independent extraction (MD). The quality of the 23 articles was critically assessed by two reviewers (LN, JP) using the critical appraisal tools from the Joanna Briggs Institute.¹⁸ Two articles were assessed using the specific tool for randomised controlled trials,¹⁹ two were assessed using the quasi-experimental studies tool²⁰ and the remainder using the cross-sectional tool.²¹ Agreement was reached on critical appraisal of all articles after discussion of any conflicting ratings. Due to the differences in outcome measures, study designs and age ranges, a narrative synthesis of the selected articles was conducted.

3 | RESULTS

3.1 | Study selection

A total of 11 063 articles were retrieved, including duplicates. A total of 161 articles were retrieved for full text review and of these, 23 met inclusion criteria (see [Figure 1](#)) and were subject to data extraction.

3.2 | Study characteristics

[Table 1](#) provides an overview of the reviewed studies' characteristics. The included articles were published between 1995²² and 2020²³ with 65% (15/23) in 2015 or after.^{6,23-36} They were conducted in a range of countries, including: the United States of America^{6,22,24-27,32-34,37,38} (11/23, 45%), Netherlands,^{28,39} Portugal,²³ Israel,²⁹ Japan,⁴⁰ Norway,^{30,41} Austria,³¹ Belgium,^{42,43} and Canada.^{35,36} Slightly less than half of the studies were conducted with young children aged <5 years^{27,29,30,33-37,42,43} (45%, 10/23), 36% (8/23) included children aged 5-12 years^{22,23,25,28,31,32,39,41} and five studies (18%, 5/23) targeted those over 13 years.^{24,26,30,38,40}

The majority of studies were observational and cross-sectional in design^{6,22-26,28,30,33-43} (82%, 19/23). Three studies^{25,35,37} involved observing parent/child dyads and the remaining were questionnaire based. Four were intervention studies.^{27,29,31,32} Two were randomised control trials (RCT), one comprising a 12 weeks group program targeting authoritative FPPs for parents with toddlers.²⁷ In the other, children were randomised to one of three groups to

view a cartoon containing different product placements (foods of low or high nutritional value and a control with no product placement).³¹ The other two studies were quasi-experimental; one used an uncontrolled pre/post within-subject design.³² The other used a control group however participants were not randomly assigned to groups.²⁹

3.3 | Measurement of parents' food communication

Food communication is represented within several different FPP domains. The measures used by the studies reviewed, often focused on measuring one specific FPP domain, rather than food communication directly. Therefore, examining the content of the measures and the number of items relevant specifically to verbal communication, was important in establishing whether the study did indeed fit the inclusion criteria. To measure FPPs a variety of validated questionnaires were used, each focusing on different aspects of interacting with children or managing mealtimes. The most commonly used measures were: Comprehensive Feeding Practices Questionnaire (CFPQ⁴⁴; used in 4 of the 23 studies), Child Feeding Questionnaire (CFQ⁴⁵; 1/23 studies), Caregiver Feeding Style Questionnaire (CFSQ⁴⁶; 3/23) and the remainder (15/23) used non-validated tools often based on specific FPPs. Three subscales from the CFPQ—"Pressure to eat", "Encourage balance and variety" and "Teach about nutrition"—featured in four studies, and 50% or more of the items in these subscales were directly related to food communication. The CFSQ is heavily focused on food communication with 14 out of the 19 items being directly relevant.

3.4 | Measurement of child outcomes

Child eating behaviours were measured with a variety of tools. Five studies used a Food Frequency Questionnaire^{23,24,39,42,43} however, four of these studies targeted specific foods using sub-scales only (eg sugar-sweetened drinks, fruit) and therefore used less than ten items. These FFQs were also parent-reported, thus providing a lower validity compared with the child report version.⁴⁷ The study by Berge and colleagues²⁴ used the comprehensive 149-item Youth and Adolescent Food Frequency Questionnaire, to assess dietary intake. The adolescents completed this tool in addition to single item questions about frequency of breakfast consumption and eating in fast-food restaurants. Hence, this study provided a thorough appraisal of dietary intake collected from the children themselves.

Child eating behaviours were measured via observational data in three studies^{25,35,37} with two coding a family meal using FPP frameworks.^{35,37} In contrast, DeJesus and colleagues²⁵ observed mother/child dyads eating a variety of foods in a laboratory setting. All verbal communication from the pairs was recorded and analysed. More comprehensive observational studies like that by DeJesus are required to better understand exactly how parents are communicating

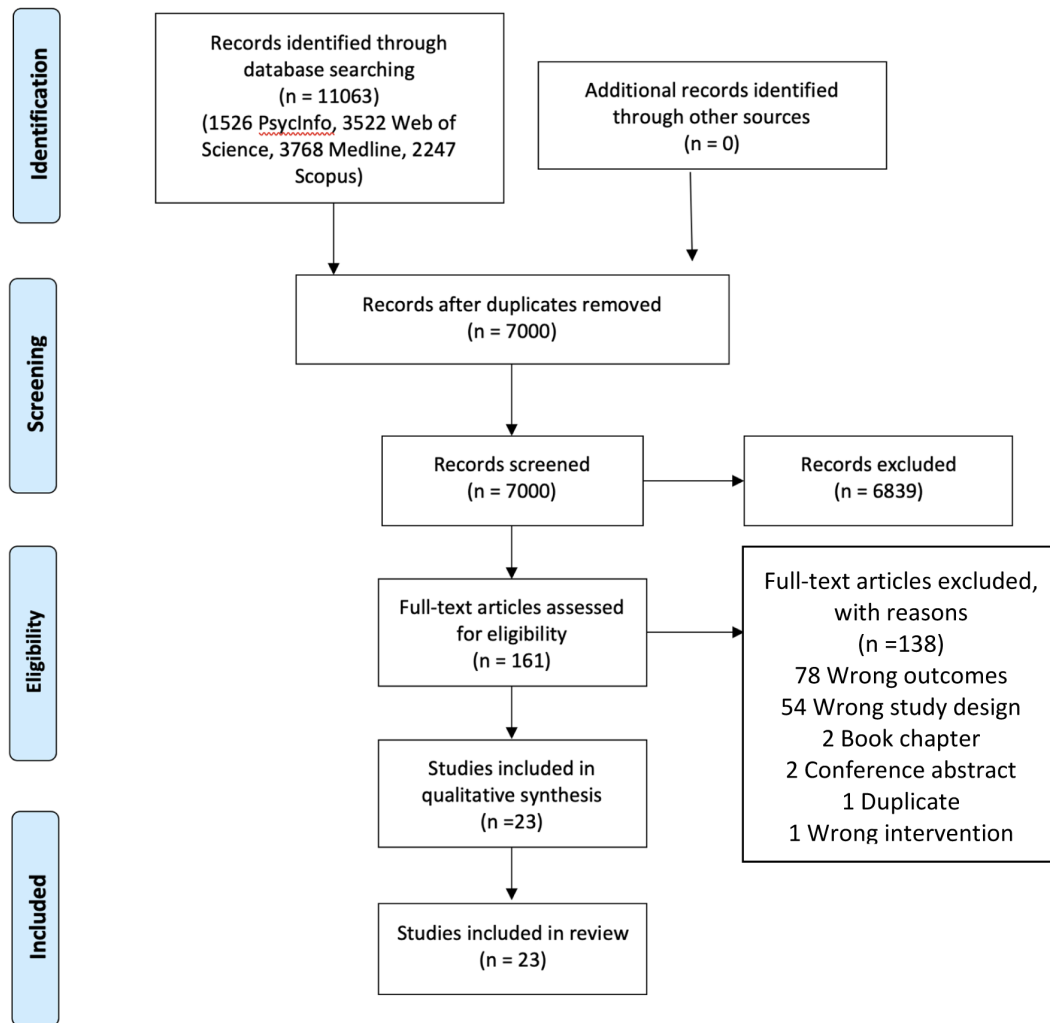


FIGURE 1 Prisma flowchart of search strategy

with their children during mealtimes as reliance on FPP frameworks often masks which specific verbal messages parents employ with their children.

Body mass index Z-scores (BMIz) were used as a proxy for nutritional status in children,⁴⁸ in 12 of the 23 studies.^{6,22-25,27,28,31,32,35-38} This is a problematic practice, as BMIz and nutritional or health status are poorly correlated and public health practice suggests moving away from using BMI as a proxy for nutritional status.⁴⁹ A dearth of studies focusing on child disordered eating was apparent, with only five studies specifically measuring disordered eating behaviours in children.^{6,22,26,38,40}

3.5 | Quality assessment

Tables S1–S3 in provide the critical appraisal summaries using appraisal tools¹⁸ for cross-sectional, quasi-experimental, and RCT studies respectively. Eighteen of the 19 cross-sectional studies did measure a variety of confounding variables (eg gender, SES). However, in eight studies they were only used to describe the

sample and were not included in any statistical analysis. One randomised control trial²⁷ was appraised as high quality, as it met all quality criteria including blinding of participants, those who delivered the interventions and assessors. Three studies^{33,34,42} used the validated CFSQ to measure food communication and the CFSQ has a high percentage (74%) of items directly related to food communication.

4 | DISCUSSION

The aim of this systematic review was to identify and synthesise the current evidence for parental food communication practices and their association with eating behaviours in children. Overall, the literature reviewed revealed that parental food communication is yet to be examined thoroughly as a discrete construct, but the evidence available shows important links with the development of children's eating patterns.

The majority of articles explored the concept of food communication as a secondary or incidental component of a larger study,

TABLE 1 Characteristics of included studies

Author/s Year Design	Country	Parent sample size	Child (0-18 y) sample size, gender and age	Parent outcome measure of "food communication" (To be included: Subscale must contain ≥50% food communication items")	Child outcome measure	Main finding
Afonso, et al 2020 Cross-sectional	Portugal	184	184 F: 47.8%, M: 52.2% 3-12 y Mean 6.4 y	HomeSTEAD family food practices survey: 6 subscales	FFQ: fruit, veg, sugar sweetened drinks, snacks, sweets BMIz	No significant finding between the 6 "food communication" based subscales and child intake.
Berge, et al 2013 Cross-sectional	United States	3528	2348 F: 53.2%, M: 46.8% Mean 14.4 y	Parent healthful eating conversation and weight-related conversations	Dieting, Unhealthy Weight Control Measures (UWCM) Extreme WCM BMIz	Parent conversation focused on weight were associated with increased risk for disordered eating behaviours. Healthful eating conversations were protective for disordered eating behaviours.
Berge, et al 2015 Cross-sectional	United States	3424	2182 F: 53.2% M: 46.8% Mean 14.4 y	Parent healthful eating and weight related conversations	FFQ (149 items) BMIz	Parent-adolescent healthful eating conversations were significantly associated with higher daily intake of fruit and veg in adolescents. Parents' weight-focused conversation were associated with higher adolescent BMIz.
DeJesus, et al 2018 Cross-sectional Observational	United States	234	234 F: 49.6 M: 50.4% 4-8 y. Mean 5.9 y	Structured eating protocol: dyads were video-taped and interactions coded for communication	How much did the child consume BMIz	Maternal BMI negatively associated with frequency of communication while eating with child. The most robust predictor of child intake was maternal food intake, rather than maternal food talk.
Ferris 2017 Cross-sectional	United States	145	145 F: 59.3% M: 41.7% Mean 14.48 y	"Solicitation" 4 items related to food communication	Body image dissatisfaction Unhealthy under/ over eating	No relationship was found between food-related parenting behaviours and adolescent eating outcomes
Fisher, et al 2019 RCT	United States	119 59 intervention 60 control	119 59 intervention F: 48.3% M: 51.7% 60 control F: 61.0% M: 39.0% Mean 3.7 y	Meal observation post group education (12 wk group focused on authoritative FPP)	Daily energy from SoFAS (Solid fats, high in saturated fats, and added sugars) 3 x 24 h dietary recalls BMIz	Intervention group focused on increasing parents' authoritative food parenting practices. Post-intervention an increase in parental authoritative food parenting practices and children consumed 23% less daily energy from SoFAS compared to the control group.

TABLE 1 (Continued)

Author/s Year Design	Country	Parent sample size	Child (0-18 y) sample size, gender and age	Parent outcome measure of "food communication" (To be included: Subscale must contain ≥50% food communication items ^a)	Child outcome measure	Main finding
Gevers, et al 2015 Cross-sectional	The Netherlands	888	888 F: 49.7% M: 50.3% Mean 7.9 y	CSPQ: Comprehensive Snack Parenting Questionnaire	Intake of energy dense snack foods per week (13 qu's) BMIz	Parents who engaged in food communication practices (discussion, education, feedback) had children with lower intake of discretionary foods
Globus, et al 2019 Intervention Non-randomized experimental	Israel	128 86 intervention 42 control	128 4-6 months for intervention F: 48.8% M: 51.2% 11 mo control F: 46.3% M: 53.7%	Mealtime observation post-groups education using CFS (Chatter Feeding Scale) to assess interactions between dyads	Mealtime observation post group education using CFS (Chatter Feeding Scale) to assess interactions between dyads.	Compared to the control group, mothers in the intervention group made fewer negative statements about food intake or preferences to their infants. Infants in the control group rejected the food, cried and arched their back more than those in the intervention group.
Hirokane, et al 2005 Cross-sectional	Japan	221	221 F: 100% 12-15 y Median 14 y	Single item: Conversation about "diet"	Modified Dieting Behavior Scale	There was a significant positive correlation between mothers who responded they did "have conversations about diet" and the dieting behaviours in adolescents. In comparison to mothers who reported not having conversations about diet.
Kristiansen, et al 2017 Cross-sectional	Norway	439	439 F: 50.8% M: 49.2% 3-5 y	Parental encouragement: Reactive encouragement and child involvement	Frequency and variety of vegetable intake across 18 different vegetables.	Parents' reactive encouragement had a negative correlation with child vegetable consumption (both in frequency and variety). Child involvement (eg food preparation) showed a positive association with child vegetable frequency and variety.
Loth, et al 2015 Cross-sectional	United States	2382	2793 F: 53.2% M: 46.8 Mean: 14.4 y	CFQ: pressure to eat	Dieting frequency, unhealthy and extreme weight control behaviors, binge eating BMI	Family meals were found to protect against disordered eating behaviours, however in boys a modifier exists. When parents engage "pressure to eat" during family meals, boys are more likely to report unhealthy and extreme weight control behaviors.

(Continues)

TABLE 1 (Continued)

Author/s Year Design	Country	Parent sample size	Child (0-18 y) sample size, gender and age	Parent outcome measure of "food communication" (To be included: Subscale must contain ≥50% food communication items")	Child outcome measure	Main finding
Melbye, et al 2013 Cross-sectional	Norway	963	796 F: 51.0% M: 49.0% Mean: 10.8 y	CFPQ-Norwegian version. Encourage balance & variety, pressure to eat, teaching about nutrition	Child cognitions related to vegetable intake and child vegetable consumption	Parental verbal encouragement of balance and variety was directly associated with increased child vegetable consumption (ie no mediation).
Naderer, et al 2018 RCT	Austria	175	175 F: 51.4% M: 48.6% Mean 8.41 y	Active food-related mediation scale (verbal explanations related to food, eg healthy choices, consequences, benefits); 3 items	Child eating behavior: what food did they select after watching the cartoon BMIz	High levels of parental "active food- related food communication" were shown to be positively related to the selection of a low nutrition snack by the child. For parents who gave very high levels of active food-related food communication there was no differences in children selecting low nutrition snack in the intervention vs control group.
Orrell-Valente, et al 2007 Cross-sectional Observational	United States	142	142 F: 52.0% M: 48.0% Mean ~5 y	9 FPP were coded for both parents	A count was made of child responses.	Children's compliance was most highly correlated with parents giving neutral prompts. Refusal to eat was most highly correlated with pressure tactics and threats.
Otterbach, et al 2018 Intervention, Pre/ post within subject design (Longitudinal)	United States	85 (completed baseline)	85 F: 56.0% M: 44.0% Mean 5.9 y	Assess the impact of group intervention (responsive FPP) CFPQ: Encourage balance & variety, teaching about nutrition	Frequency of child health behaviors (11 items) BMIz	Significant increase in frequency of parent reported use of "encourage balance & variety." Nil for other FPP's. No significant changes in child behaviours (significant changes in parent intake, increased fruit, veg and low-fat dairy intake).
Sleddens, et al 2014 Cross-sectional	The Netherlands	1654	1654 F: 48.7% M: 51.3% Mean 6.6 y	PFSQ: promoting & encouragement to eat. CFQ: pressure to eat	FFQ: using 10 food items of interest	Pressure to eat had a negative association with child dietary behavior. Encouragement was found to have a positive effect on child behavior (stronger association with those reared in a positive parenting context).

TABLE 1 (Continued)

Author/s Year Design	Country	Parent sample size	Child (0-18 y) sample size, gender and age	Parent outcome measure of "food communication" (To be included: Subscale must contain ≥50% food communication items")	Child outcome measure	Main finding
Thelen & Cormier 1995 Cross-sectional	United States	70	70 F: 50.0% M: 50.0% 9-10.5 y	FHES (Family History of Eating-Student version) measures concern about child's weight	CHEAT: Children's Eating Attitudes Test BMIz	Daughters: desire to be thinner was significantly and positively correlated with parental encouragement to control weight by both mother and father. Sons: none of the correlations between encouragement to control weight and disordered eating were significant.
van der Horst & Sleddens 2017 Cross-sectional	United States	1005	1005 F: 47.5% M: 52.5% 2.7 y	CFPQ: encourage balance & variety, pressure to eat. CFSQ: 14/19 food communication items	CEBQ: food approach and food avoidance	Clusters where caregivers had high levels of responsiveness was positively and significantly correlated with higher levels of positive child eating behaviors. Clusters where caregivers had higher levels of demandingness and pressure (and lower responsiveness) have higher levels of child food avoidance.
Vereecken, et al 2004 Cross-sectional	Belgium	316	316 F: 49.0% M: 51.0% Mean 4.7 y	Own research tool based on FPP: Verbal praise, verbal encouragement, verbal discourage	FFQ: fruit, vegetable, sweets, soft drink	Verbal praise was positively and significantly correlated with the consumption of vegetables. Verbal encouragement of fruit was positively correlated with higher child fruit intake.
Vereecken, et al 2010 Cross-sectional	Belgium	755	755 F: 50.0% M: 50.0% Mean 3.5 y	CFSQ: 14/19 food communication items	FFQ: 6 food items of interest	Responsive feeding practices (child- centered) were positively correlated with child's fruit and vegetable intake, compared to demandingness (parent- centered) were negatively related to child's vegetable intake.
Vollmer 2019 Cross-sectional	United States	108	108 F: 43.0% M: 57.0% Mean 4.0 y	CFPQ: encourage balance & variety, pressure to eat, teaching about nutrition. CFSQ: 14/19 food communication items	PALS: Preschool Adapted Food Liking Survey; fruit, vegetables, high fat/sugar foods	Encouraging balance & variety with "authoritarian" feeding style (demandingness) was correlated with less child fruit and veg intake. When encouraging balance & variety combined with "uninvolved" feeding style there was no effect on child intake.

(Continues)

TABLE 1 (Continued)

Author/s Year Design	Country	Parent sample size	Child (0-18 y) sample size, gender and age	Parent outcome measure of "food communication" (To be included: Subscale must contain ≥50% food communication items")	Child outcome measure	Main finding
Walton, et al 2019 Cross-sectional Observational	Canada	137 74 mothers 63 fathers	73 F: 56.2% M: 43.8% Mean 3.3 y	Family Mealtimes Coding System (FMCS) based on CFQ items	Nutri-STEP: Nutrition Screening Tool for Every Preschooler: 17 item questionnaire to assess eating habits. BMIz	Positive communication about the target child's food was associated with lower nutrition risk and family functioning did not moderate this result. Nutrition risk: as assessed by a validated questionnaire, including child eating behaviours and dietary intake.
Watterworth, et al 2017 Cross-sectional	Canada	62 31 mothers 31 fathers	40 F: 47.5% M: 52.5% Mean 3.5 y	CFPQ: Encourage balance & variety, pressure to eat	Nutri-STEP: Nutrition Screening Tool for Every Preschooler: 17 item questionnaire to assess nutrition risk. BMIz	Mothers: encouragement of balance & variety was associated with lower child nutrition risk. Fathers: pressure to eat was associated with higher child nutrition risk. Nutrition risk: as per above.

Abbreviations: BMI, body mass index; CEBQ, child eating behavior questionnaire; CFPQ, comprehensive feeding parent questionnaire; CFQ, child feeding questionnaire; CFSQ, caregiver feeding style questionnaire; F, female; FFQ, food frequency questionnaires; FPP, food parenting practices; M, male; PFSQ, parent feeding style questionnaire.

most often focused on the prevention of high BMI in children. Intervention research was rare (four studies) whereas most studies focused heavily on domains of FPPs, without a direct focus on exactly what messages parents were using in their communication. As such, after summarizing outcomes from intervention studies, we provide a synthesis of the literature as it relates to the three higher-order domains of Vaughn's FPP map.¹⁰

4.1 | Intervention studies

This review yielded limited intervention studies.^{27,29,31,32} Globus and colleagues performed a non-randomised experimental study, exploring early parent training and its impact on mother-infant feeding interactions.²⁹ It was the only study to examine infants; it indicated that significantly more positive mother-infant feeding interactions were established in the intervention group than the control.²⁹ Otterbach and colleagues examined 3 to 11 year-olds using a pre/post within subject design, with a focus on preventing high BMI.³² The eight week group intervention aimed to develop responsive food parenting practices. Although the findings revealed a significant increase in frequency of parent-reported use of the strategies, this did not translate into significant changes in children's eating behaviours. Interestingly, the parents' dietary intake did change significantly (increased fruit and vegetables and low-fat dairy), suggesting they adopted many of the strategies. Perhaps the older child age range is less amenable to modification and suggests a need for interventions with younger children.

One RCT included in the review focused on toddlers (Mage = 3.7 years).²⁷ The intervention involved a 12 weeks education group for parents to increase authoritative food parenting practices and prevent high BMI. Post-intervention the children of parents in the intervention group did consume less daily energy from high fat and added sugar foods. However, the 59 mothers in the intervention group only attended an average of 6.4 out of sessions, indicating the duration/intensity was not practical for most. The other RCT focused on older children (Mage = 8.4 years).³¹ This intervention involved two experimental groups and one control; all viewing the same children's cartoon but with different product placements (food with low or high nutrition value and no product for the control). Once the viewing was over, the children were directed to choose a snack from the (high and low nutrition) options provided. There was a positive relationship between parents who reported providing nutrition education and children choosing the low nutrition snack, which was contrary to the authors' hypothesis. The authors suggested that perhaps a "forbidden fruit" effect explained this finding. Perhaps it is also possible that the verbal communication parents provided when educating their children was more akin to "weight talk", which is known to drive disordered eating.¹¹ Unfortunately, without detailed coding of the precise language parents use when communicating about food to their children, the mechanisms of action for these outcomes remain unknown.

4.2 | Food communication and autonomy support or promotion (parental responsiveness) parenting practices

A child-focused approach to feeding is termed *responsive feeding*. Responsive feeding requires caregivers to acknowledge and act on a child's cues for hunger and satiety.⁵⁰ The Caregivers Feeding Style Questionnaire (CFSQ)⁴⁶ overtly measures the "responsiveness" and "demandingness" of caregivers as they engage in child feeding. "Responsiveness" measures the extent to which caregivers show affection, warmth, acceptance and involvement in a child-centred way (eg Compliment the child for eating - "What a good boy! You're eating your beans!")⁴⁶ This approach is in direct contrast to "demandingness" which measures "how much" the parent is encouraging.⁴⁶ There is a subtle but distinct difference "Hurry up and eat your vegetables!" is in contrast to the "Good boy!"

Several studies reviewed^{33,34,39,42} utilised the CFSQ and concluded that caregivers reporting high levels of responsiveness had children who displayed more positive eating outcomes. In the toddler age range (3-4 years) both Vollmer³⁴ and Vereecken⁴² found that when parents encourage children with an authoritarian style (low in responsiveness), children were much less likely to consume fruits and vegetables. Conversely, when parents reported high responsiveness (ie to a child's cues of satiety and hunger) children's vegetable intake was higher. Importantly, Vollmer found when parents "encourage variety and balance," but have an "uninvolved style" (ie low responsiveness) their "encouraging" appears to have no effect on toddlers' fruit and vegetable intake.³⁴ Orrell-Valente and colleagues corroborate this finding.³⁷ Nine FPP strategies used by parents were coded for and a count was made of the eating responses from the kindergarten child (eg they complied, refused). Neutral prompts (such as using a matter-of-fact tone, no explanation, eg "Don't forget to eat your meat") from parents were most highly associated with eating compliance. Refusal to eat was most highly correlated with "pressure" to eat, which in essence is a form of "demandingness" and control, often conceptualised as the opposite of responsiveness. Gevers²⁸ found that when examining children's intake of "high-density snack foods" and parents FPPs (using the validated Comprehensive Snack Parenting Questionnaire, CSPQ), parents who provided high levels of food communication in the form of encouragement, feedback and discussion, had children with the lowest frequency of "energy-dense snack food" per week.

Several studies explored parental involvement and encouragement. Kristiansen and colleagues³⁰ examined encouragement via three subscales: "reactive encouragement," "child involvement" and "reward," with the first two containing greater than 50% food communication items. Associations between these two subscales and the variety and frequency of children's vegetables intake were explored. Findings indicated that "reactive encouragement" (ie "I encourage my child to try a few bites of the vegetables" and "I tell my child that vegetables taste good") resulted in a decrease in vegetable intake. The outcome was unexpected to the authors, as they predicted the reverse. In contrast the "child involvement" subscale

(examples include "I ask my child to help select vegetables at the grocery store") had a significant positive association with vegetable intake, though only in mothers with high education levels. These findings support the role of child-focused food communication, as opposed to a more instructional and demanding style.

4.3 | Coercive control

Coercive control involves parents using pressure and dominance over children's eating. A range of validated tools exist for measuring coercive control, with the CFPQ being amongst the most widely used in the studies reviewed (5/23, 22%).^{32-34,36,41} For this review, teasing apart the items related to food communication often required delving into subscales of questionnaires. "Pressure to eat" is a subscale of the CFPQ with two of the four items being relevant to "food communication." The items explore verbal pressure being used by parents to get their children to eat (eg "If my child says, "I'm not hungry", I try to get him/her to eat anyway"). Several studies^{6,34,36,39} examined the use of parental pressure and children's eating habits. Across a variety of ages "pressure to eat" was associated with poorer dietary outcomes. Young children (3.5-6 years) were targeted in two studies^{36,39} and both found statistically significant associations between high levels of pressure and high child nutrition risk (eg less "healthful intake"). Because these studies were cross-sectional, it is difficult to say whether parents became pushier as children became more avoidant, or the reverse. Either way, these studies suggest child-centred verbal communication is likely important in encouraging children to develop positive eating habits.

Examining an older age range, Loth and colleagues reiterated the finding that pressure to eat has a detrimental effect on children's eating.⁶ For adolescent boys, the protective factor associated with family meals was negated by the presence of parents' pressure to eat. The boys were more likely to engage in disordered eating where there was pressure exerted at mealtimes.⁶ Such findings highlight the atmosphere of family mealtimes is vital to children's eating and that conversation (or coercion) is a major contributor to atmosphere.

Five studies focused on parental food communication and disordered eating behaviours in children and adolescents.^{6,22,24,26,38} Thelan and colleagues explored parental verbalizing of encouragement to "diet" among pre-pubescent girls and boys. In daughters, a significant positive correlation was found between parents' encouragement to "diet" and daughters' desire to be thinner.²² In contrast, parents' dieting encouragement did not show correlations with any disordered thoughts or behaviours in sons. Consistent with this finding, Berge³⁸ found that in an older age range (Mage = 14.4 years) parents communicating about a child's weight/size and "dieting" increased risk for disordered eating, whereas parents who focused on communicating about "healthful" eating, rather than "dieting" appeared to protect against disordered eating in children.³⁸ A later study by Berge²⁴ confirmed that parents conversing with their adolescents about healthful eating was significantly correlated with higher adolescent fruit and vegetable consumption, as opposed to

weight focused and dieting conversations, which were significantly associated with higher adolescent BMI. Therefore, focusing on the behaviours of eating healthfully, as opposed to commenting about weight and dieting or the moralizing of food, is important for parents and appears to play a role in determining whether adolescents will engage in disordered eating.

4.4 | Structure and family meals

Within Vaughan's FPP map,⁹ the third domain is *Structure* and the subsection *meal and snack routines* is divided into four areas; (1) atmosphere of meals, (2) distractions, (3) family presence and (4) meal and snack schedule. Several studies examined the nuances of family conversation content at mealtimes.^{22,24,28,38} Parental comments around limiting food because of weight concerns was found to increase adolescents' risk of disordered eating behaviours in three studies.^{22,24,38} To prevent this, perhaps encouraging parents to refrain from such topics is required at a much earlier stage in development. Dejesus²⁵ structured eating protocol demonstrated that overall food communication was low between mothers and toddlers, suggesting that some guidance to mothers on how to communicate about food is warranted, and especially information on how to do this without promoting dogmatic rules, pushing to eat or moralizing about food and eating.⁵¹

5 | IMPLICATIONS FOR RESEARCH AND PRACTICE

Studies in this review suggest that "how" parents communicate with their children does shape children's eating habits in important ways, but there is a dearth of studies with a primary focus on helping parents to effectively communicate about food with their children in a way that increases the child's chances of developing positive eating habits. In particular, there is a lack of research in the early years focused on food communication. Although limited in number, the intervention studies did show that a focus on developing authoritative and responsive parenting supports parents to communicate with their children in a more holistic and functional way, rather than simply encouraging children to adopt dieting or moralizing messages, which appear to have the unintended effect of increasing disordered eating. Interestingly, two papers in this review explored the intersection between parenting styles and the use of particular FPPs.^{33,34} Given that parenting interventions are increasingly informed by parenting styles, tailoring interventions for maximum impact, future research on the intersection between parenting style and food communication could provide important benefits for the development of future preventive interventions.

An important finding is that measures used to assess parental food communication require further development. Extending existing measures to include questions relating to the specific categorisation of food (eg do you use the words "good" and/or "bad" to

describe food?) and investigating exactly how parents can communicate about health instead of weight, would be advantageous in broadening our understanding of how such communication affects children's eating behaviours.

Parents generally want to guide and help their children to establish positive eating habits, however, confusion is widespread and feeding young children is a complex task. The daily repetition of mealtimes with young children provides the ideal foundation for parents to make a positive impact on their children's relationship with food into the future, if they can use responsive language. Deeper insight into the everyday language that parents use with children at mealtimes, will assist in the development of interventions to prevent disordered eating and negative outcomes for children.

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CONFLICT OF INTEREST

Authors have no conflicts of interest to declare.

AUTHOR CONTRIBUTIONS

Lyza Norton: conceptualization, methodology, investigation, data curation, writing -original draft, reviewing and editing, visualization. Joy Parkinson: conceptualization, methodology, investigation, writing- reviewing and editing. Neil Harris: conceptualization, methodology, investigation, writing- reviewing and editing. Morgan Darcy: investigation, data curation, writing- reviewing and editing. Laura Hart: conceptualization, methodology, investigation, writing- reviewing and editing. We confirm that all authors meet the criteria for authorship, have approved the final article and that all those entitled to authorship are listed as authors.

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SUPPORTING INFORMATION

Additional supporting information may be found in the online version of the article at the publisher's website.

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