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AUTONOMY AT THE TABLE - THE ROLE OF FOOD PARENTING PRACTICES IN CHILDREN'S FRUIT AND VEGETABLE CONSUMPTION: A SYSTEMATIC REVIEW PROTOCOL

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ABSTRACT

Introduction: despite parents' efforts, many children have nutrient-poor diets with insufficient fruit and vegetable consumption, contributing to childhood overweight and obesity. Parents significantly influence children's eating habits at home through their food parenting practices, which can be categorized into three main types: coercive control, structure, and autonomy support. Although there are systematic reviews on food parenting practices, they primarily focus on coercive control and structure, leaving a gap in the investigation of autonomy-supportive practices. This systematic review aims to investigate the relationship between autonomy-supportive practices and fruit and vegetable consumption in children aged 2 to 12 years. Herein, we present the study protocol. **Methods:** This protocol was developed in accordance with the PRISMA-P (2015) guidelines and registered in PROSPERO (CRD42023442680). The search will be conducted in the PubMed®, Scopus™, Web of Science™, PsycINFO®, EMBASE®, and LILACS® databases, with no restrictions on publication year, country, or language. In addition to the databases, the search will be complemented by manual searches of reference lists from the included articles and gray literature. Articles that evaluated at least one parental autonomy-supportive feeding practice and its relationship with fruit and vegetable consumption in healthy children aged two to twelve years will be included. The results will be systematically categorized and presented in tables and figures. The risk of bias will be assessed using tools from the Joanna Briggs Institute, and the quality of the studies will be evaluated using the GRADE system. Any disagreements between reviewers will be resolved by a third reviewer. **Discussion:** This review will be important for understanding the influence of parental autonomy-supportive feeding practices on children's fruit and vegetable consumption, potentially informing public policies and health practices that promote healthy eating habits from childhood.

Keywords: Feeding practice, Parenting, Children, Dietary intake, Fruits, Vegetables

STRENGTHS AND LIMITATIONS

This systematic review protocol has several strengths. Firstly, the future systematic review results, conducted rigorously and transparently, may identify gaps in the existing literature, potentially stimulating further research to deepen the understanding of food parenting practices and their impacts on child health. Secondly, by investigating the relationship between parenting practices and children's consumption, this review could contribute to understanding and promoting healthy eating habits from an early age, which may have long-term effects on individual's lives. The review may also help identify more effective food parenting practices for promoting fruit and vegetable consumption, providing valuable evidence to guide health professionals and child caregivers. It is hoped that the results will serve as a foundation for developing programs and interventions that encourage parental practices supporting food autonomy in various contexts, such as homes, schools, and primary health care. Including children aged two to twelve can also be a distinguishing factor, covering a crucial age range for developing eating habits, potentially allowing a broader understanding of parental influence on child health. Finally, the review could be important for supporting public health programs and policies to improve child health.

However, some limitations are expected. Firstly, tools used to assess food parenting practices and food consumption are often self-reported, which increases the likelihood of social desirability bias. Secondly, many studies may be cross-sectional, which limits the ability to make causal inferences between variables. Additionally, heterogeneity in the definitions and methodologies of the included studies may complicate the comparison and synthesis of results.

1. INTRODUCTION

Despite parents' and families' efforts to provide adequate and healthy nutrition, many children still have nutrient-poor diets[1]. In 2019, according to the report The State of the World's Children[2], two out of five children did not consume fruits or vegetables, thus missing out on the essential nutritional benefits of these foods. At the same time,

the consumption of processed snacks and beverages among young children is high, contributing to the early development of overweight and obesity[2].

Fruits and vegetables are nutrient-rich foods that provide vitamins, minerals, dietary fibers, and antioxidants. They should be introduced early in a child's diet and offered regularly[1]. The World Health Organization (WHO) recommends a daily intake of 400 grams (five servings) of fruits and vegetables to promote adequate health[3]. A diverse diet supports healthy growth and development throughout life and reduces the risk of non-communicable chronic diseases (NCDs), contributing to lower mortality rates from these conditions[3,4].

The home environment is fundamental to a child's physical, cognitive, social, and emotional development[5,6]. Particularly in the context of nutrition, parents significantly influence the formation of eating habits and preferences through their actions and behaviors. In the scientific literature, these behaviors are referred to as food parenting practices. Food parental practices encompass the behaviors and actions, whether intentional or not, that parents engage in within the realm of feeding their children, with the aim of shaping their attitudes, behaviors, and beliefs[7].

According to the model proposed by Vaughn et al. (2016)[7] and aligned with Self-Determination Theory (SDT)[8], food parenting practices are divided into three main categories: coercive control, structure, and autonomy support. Coercive control practices in the context of feeding include pressure to eat, food restriction, threats and bribes, and using rewards to influence children's behavior. The structure involves organizing the food environment, setting and communicating clear and consistent rules, meal setup, and family eating habits. The autonomy support involves nutritional education, child involvement in food acquisition and preparation, encouragement, praise, reasoning, and negotiation[7].

Studies have shown that structure and autonomy support practices are associated with positive outcomes in children's health, while coercive control practices are linked to negative consequences. However, some studies present inconsistent results or lack statistical significance[7,9]. These inconsistencies may be attributed to contextual and individual variables that are not uniformly controlled across studies or to a lack of clarity in the definitions used to describe parental practices[7].

Although some systematic reviews have investigated the relationship between food parenting practices and children's eating habits[9,10], these reviews were published some time ago and primarily focused on coercive control and structure practices. There has been growing interest in studying food parenting practices in recent years, leading to the development of new instruments to assess these practices more comprehensively. In this regard, there remains a gap in the literature, particularly concerning the investigation of the relationship between autonomy-supportive feeding practices and children's eating habits. This systematic review aims to fill this gap by examining and synthesizing the available evidence on the relationship between autonomy-supportive food parenting practices, as defined by the model proposed by Vaughn et al. (2016)[7], and fruit and vegetable consumption in children aged two to twelve years. Herein, we present the study protocol.

2. MATERIALS AND METHODS

2.1. Protocol and Registration

This review protocol was developed following the guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses for Protocols 2015 (PRISMA-P 2015)[11,12] (File S1). To ensure transparency and reproducibility, and to avoid duplicating efforts on the same research topic, the protocol was submitted and registered with the International Prospective Register of Systematic Reviews (PROSPERO) under registration number CRD42023442680. Any changes to this protocol during the study will be updated in the PROSPERO registry and described in the final manuscript.

2.2. Information Sources and Search Strategy

The Population, Intervention or Exposure, Comparison, Outcomes, and Study Design - PICOS acronym[13] (Table 1) was used to formulate the research question*: "Is there a relationship between autonomy-supportive parental feeding practices and fruit and vegetable consumption in children aged two to twelve years?"* This age range was chosen to align with the definition of children provided by the Child Health and Human Development (NICHD) and the Food and Drug Administration (FDA)[14]. Furthermore, studies examining food parenting practices among child caregivers often cover a broad

age range, including early and middle childhood, which can make it challenging to distinguish clearly between age groups. This review will focus on children, as this is the period when the home environment strongly influences the formation of eating habits, shaping children's attitudes and perceptions of food.

Table 1 - PICOS Criteria for Study Inclusion

Parameter	Inclusion Criteria	Exclusion Criteria
Population	Caregivers or primary guardians of healthy children aged two to twelve years.	Caregivers of children under two years old or adolescents over twelve years old. Caregivers of children with conditions that may affect feeding (e.g., celiac disease, food allergies, food intolerances, autism spectrum disorder, Down syndrome, diabetes).
Intervention or Exposure	Evaluated at least one parental autonomy-supportive feeding practice and used validated instruments or tools with verified internal consistency of items.	Studies that used statistical approaches to combine parental practices from multiple domains into a single variable, i.e., evaluating patterns/profiles of parental practices. Patterns or profiles that only included autonomy-supportive practices will be included in this review.
Comparison	Not applicable	Not applicable
Outcome	Evaluated fruit and/or vegetable consumption through dietary frequency questionnaires, food diaries, and/or direct food weighing, or assessed preferences for these foods.	Evaluated combined fruit and vegetable consumption within a single dependent variable category or assessed fruits and vegetables as separate measures. Studies that combined fruit and vegetable consumption with other types of foods.
Study Type	Observational studies (cohort, case-control, cross-sectional, momentary ecological assessment). Intervention studies (randomized clinical trials and experimental studies).	Studies with missing and/or unclear data, even after requesting information from authors, letters, reviews, conference abstracts, opinion pieces, case reports, poster presentations, news summaries, theses, and dissertations.

The following databases will be consulted to identify relevant studies: PubMed® (National Library of Medicine), Scopus™ (Elsevier), Web of Science™ Core Collection

(Clarivate Analytics), PsycINFO® (American Psychological Association), EMBASE® (Elsevier), and LILACS® (BIREME). A limited search of the first 100 records will also be conducted in Google Scholar®. Searches in for PubMed® will cover all fields, while searches in the other databases will be performed on titles, abstracts, and keywords. Secondary searches will include reviewing the reference lists of included studies and relevant systematic reviews. Additionally, if information is lacking, the authors of the articles will be contacted.

Indexed terms and their synonyms were used to identify all relevant articles with boolean operators. The "OR" operator combined similar terms, broadening the scope of each search strategy. The blocks of terms were then combined using the "AND" operator. Searches were conducted in the databases without restrictions on year, country, or publication language. Following the recommendations of Greenhalgh and Peacock (2005)[15], systematic review team experts were consulted to refine the search strategy. Table 2 details the structure of the overall search strategy, including the descriptors and boolean operators used in the databases. Specific search strategies for each database can be found in File S2. All studies meeting this review's eligibility criteria (Table 1) will be included.

Table 2 - Keywords used in the search strategy grouped into blocks.

Block (PICO)	
# 1 P	**(1) child OR children OR preschool OR "child, preschool" OR "children, preschool" OR "preschool child" OR "preschool children" OR "preschool-aged child" OR preschoolers**
# 2 I	**(2) parenting OR "child rearing" OR "food parenting" OR "parenting practices" OR "parental feeding practice" OR "parental feeding practices" OR "parenting feeding practices" OR "parent feeding practice" OR "parent feeding practices" OR "parents feeding practices" OR "maternal feeding practices" OR "food parenting practice" OR "food parenting practices" OR "parenting child-feeding practices" OR "parental child-feeding practices" OR "parental feeding behaviour" OR "parental feeding behaviours" OR "parental feeding behavior" OR "parental feeding behaviors" OR "feeding strategy" OR "feeding strategies" OR "parental feeding style" OR "parental feeding styles" OR "family feeding practices" OR "rearing child" OR "autonomy support" OR "autonomy promotion"**
# 3 O	**(3) eating OR "food preferences" OR fruit OR vegetables OR "food intake" OR "dietary intake" OR "dietary intakes" OR "eating habits" OR "food preference" OR "healthy food" OR "healthy eating" OR "healthy intake" OR "food consumption" OR fruits OR vegetable**
Search Strategy	**(#1) AND (#2) AND (#3)**

Note: "P" stands for Population, "I" refers to Intervention or Exposure, and "O" represents Outcome.

2.3. Eligibility Criteria

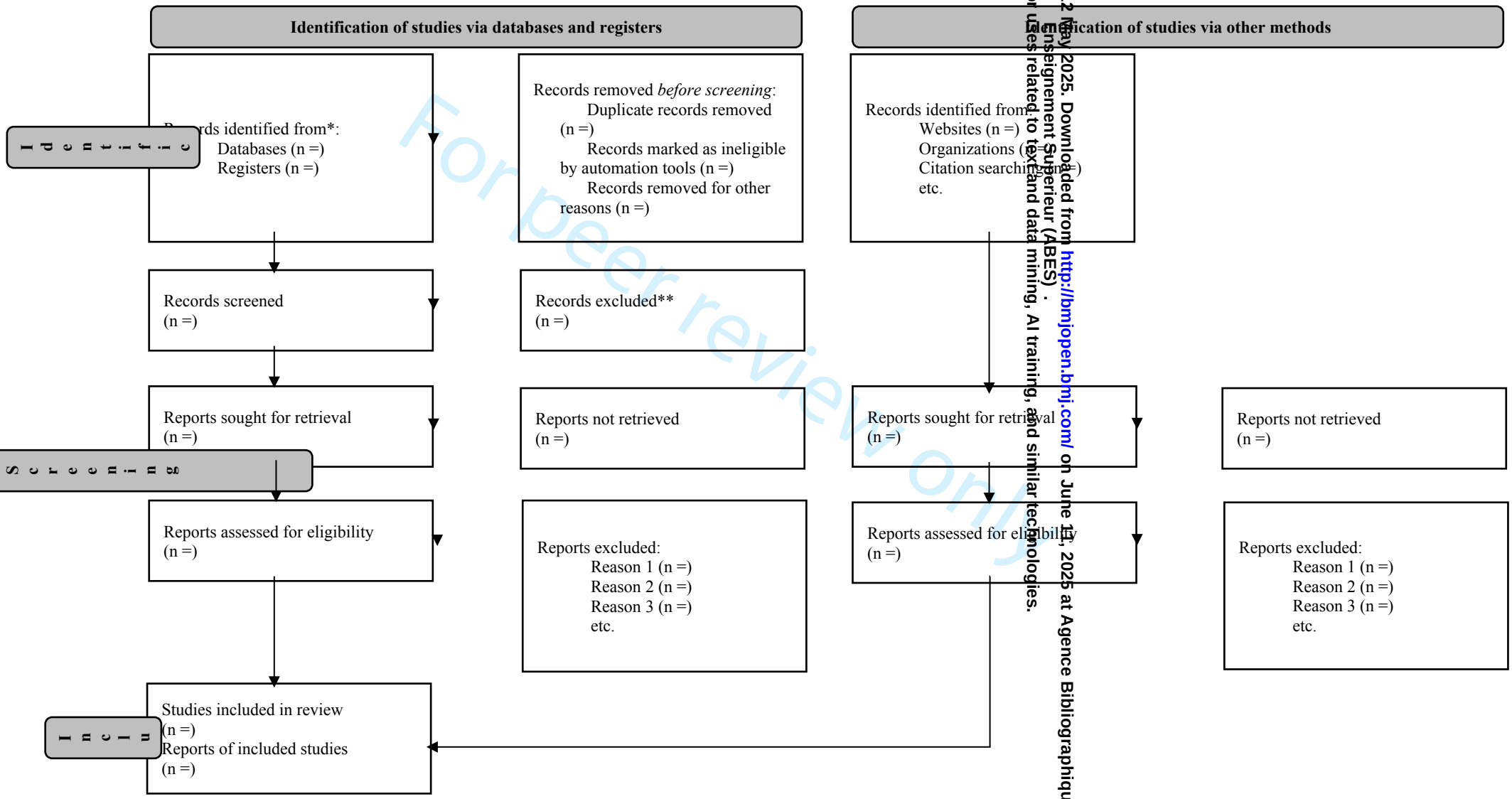
The eligibility criteria are detailed in Table 1, with no restrictions on publication year, country, or language. All included articles will be checked for possible retractions. Eligible studies for the systematic review will be rigorously examined, including the use of Scite – an acronym for "Smart Citation Index," available online (https://scite.ai/) – to confirm the validity of the evidence and identify any retraction records. Scite is a research tool that offers an innovative way to verify, assess, and contextualize citations of scientific articles. Among its various features, Scite checks if a specific article has been retracted or contested, thus ensuring the integrity of the sources used[16].

2.4. Study Selection Process

The identified articles will be selected, and their metadata will be transferred to Zotero 6.0 (Corporation for Digital Scholarship, VA, Fairfax) in RIS format, where duplicates will be identified and removed. The metadata will then be imported into Rayyan® (available online at https://www.rayyan.ai/)[17], a software specifically designed for systematic reviews, with the reviewer blinding feature enabled for evaluation.

In Rayyan®, the initial screening and selection of studies will be conducted by reading titles and abstracts to check compliance with inclusion criteria. Two independent reviewers (ECL and PRV) will perform this screening. A third researcher (PRM) will resolve any discrepancies between reviewers. In the subsequent phase, the same two reviewers will read the full text of the remaining articles to confirm eligibility. Discrepancies between reviewers during this phase will also be resolved by the third reviewer (PRM). Finally, articles deemed eligible will be included in this systematic review. The flowchart of the study selection process for this review is illustrated in Figure 1, using a model recommended by PRISMA 2020.

Figure 1 - PRISMA 2020 flow diagram for the identification, screening, and inclusion of studies in the review.



Conducting the review with independent reviewers and blinding is crucial to minimize the likelihood of individual biases that may influence the review results. This increases the impartiality and objectivity of the analysis. Additionally, using independent and parallel reviewers allows for comparing assessments made by different reviewers. In this regard, reliability (Cohen's kappa coefficient, denoted as κ) and agreement (agreement ratio) between reviewers will be measured, increasing confidence in the results obtained, using R software version 4.3.3 (R Foundation, Vienna, Austria). The κ coefficient ranges from -1 to 1, reflecting different levels of agreement between reviewers. A value of $0 < \kappa \leq 0.20$ indicates no agreement; $0.21 < \kappa \leq 0.39$ indicates minimal agreement; $0.40 < \kappa \leq 0.59$ indicates weak agreement; $0.60 < \kappa \leq 0.79$ indicates moderate agreement; $0.80 < \kappa \leq 0.90$ indicates strong agreement; and ≥ 0.90 indicates almost perfect agreement[18].

2.5. Data Extraction, Synthesis, and Analysis

Data will be extracted, assessed, and synthesized independently and blindly by the same two reviewers (ECL and PRV). Any discrepancies will be resolved by the third reviewer (PRM), if necessary. An extraction spreadsheet has been developed with the support of experts from the team, and it includes information such as publication details (authors, year, country), study type, participant characteristics (age, sex, sample size), autonomy-supportive practices evaluated, instruments used, methods of dietary intake assessment, confounding variables, and key results (Supplementary File S3).

In addition to the aforementioned descriptive synthesis, this review will consider performing a quantitative synthesis through meta-analysis if the quantitative data from our investigation allows for it. Regression coefficients and Pearson and Spearman correlation coefficients will be used to estimate the association between food parenting practices and children's fruit and vegetable consumption, as reported in the included studies. The meta-analysis will calculate the weighted average of regression and correlation coefficients to estimate the association's average effect, considering each study's sample weight. Results will be objectively categorized and, if necessary, further subcategorized[16]. These findings, extracted from the studies, will be presented clearly and concisely through figures, diagrams, or other suitable graphical elements to illustrate patterns, trends, and outcomes[20].

Statistical methods will be applied to assess the heterogeneity among studies, using the I^2 statistic to quantify variability among study results and categorize heterogeneity as mild (25–50%), moderate (50–75%), or severe (>75%)[19]. The analysis will be conducted with a 95% confidence interval. Additionally, if two or more studies report results or information on the same data, the study with the largest number of participants will be considered. Meta-regression analysis will be performed to explore potential sources of heterogeneity. Stratified analyses will be conducted according to study region, study quality, among others. Sensitivity analysis will be carried out by recalculating the combined risk estimates after omitting each study.

In addition to the aforementioned statistical analyses, a funnel plot will be used to assess publication bias among the included studies. This plot is useful for visualizing the distribution of studies according to effect size and precision. Asymmetry in the funnel plot may indicate publication bias, where studies with positive or significant results are more likely to be published compared to studies with negative or non-significant results[21]. All statistical analyses will be conducted in R Studio version 4.3.4 (RStudio, Boston, MA), using two-sided P-values.

2.6. Methodological Quality Assessment

The same two reviewers mentioned previously (ECL and PRV) will assess the risk of bias in eligible articles using the Joanna Briggs Institute tools according to the relevant study types (Joanna Briggs Institute, 2022, available at https://jbi.global/critical-appraisal-tools)[22]. Each article will be evaluated using the corresponding checklist, with responses categorized as "Yes" if the criterion is met, "No" if not met, "Unclear" if the information is not clear in the article, and "NA" if not applicable. In case of disagreements, the third reviewer (PRM) will be consulted to resolve discrepancies. The risk of bias will be determined based on a recent systematic review that also used the Joanna Briggs Institute checklists[23]. Articles will be classified as high, moderate, or low risk of bias based on the proportion of "yes" responses: up to 49%, between 50% and 69%, and above 70%, respectively[23].

The quality of evidence from the articles included in this review will be assessed using the Grading of Recommendations, Assessment, Development, and Evaluations (GRADE) system[24]. Each study will be categorized into one of four levels: high,

moderate, low, or very low. We will use the GRADE-pro GDT software for this analysis[25].

2.7. Reviewer Training

Reviewers assessing study eligibility will undergo training on the inclusion and exclusion criteria. They will also receive training on the tools for bias risk assessment and data extraction spreadsheets.

2.8. Ethics and Dissemination

Ethical approval is not required for this type of study. The results will be submitted for publication in a peer-reviewed journal.

3. DISCUSSION

The influence of food parenting practices on children's fruit and vegetable consumption is relevant, given the fundamental role of nutrition in child development[26]. Parents, as primary influencers in the home environment, are pivotal in shaping their children's eating habits[7,26]. Parents' actions, strategies, and behaviors, known as food parenting practices, can significantly impact children's food preferences and eating patterns, directly affecting their health and well-being both in the present and in the long term[7].

The home environment, particularly parental behaviors related to food, is a critical factor for children's acceptance and consumption of fruits and vegetables. When parents consistently offer a variety of healthy foods, including fruits and vegetables, and include them into family meals, children tend to develop a preference for these foods and consume them regularly. Additionally, parents can serve as positive role models by demonstrating healthy eating behaviors, such as eating fruits and vegetables in their children's presence and encouraging the adoption of similar habits[9,10,27].

Conversely, scientific literature has shown that non-responsive parental practices negatively affect children's health[7]. These practices involve parents not adequately responding to their children's hunger and satiety cues[28]. Strategies such as pressuring children to eat, to clean their plates, or imposing food restrictions can lead to negative

relationships with food, resulting in reduced acceptance of healthy foods, increased preference for restricted foods, and the potential development of disordered eating patterns[7]. Food restriction is associated with higher Body Mass Index (BMI), while pressure to eat is associated with lower BMI, particularly in cross-sectional studies[29].

On the other hand, responsive feeding practices, such as autonomy-supportive practices where parents appropriately and positively respond to children's hunger and satiety cues, have been associated with more favorable outcomes[7,28]. According to Vaughn et al. (2016)[7], these autonomy-supportive practices include various strategies that encourage children's self-determination. For example, involving children in meal preparation is one such practice, allowing them to learn about food and to develop cooking skills early. Encouraging the exploration of new foods, such as fruits and vegetables, and teaching nutrition according to the child's age helps increase their awareness about the importance of balanced eating. Additionally, praising children for making healthy food choices reinforces positive behaviors.

However, scientific literature shows some inconsistencies in results, which may be attributed to contextual and individual variations that are not adequately controlled. Moreover, some studies lack clarity in defining food parenting practices, which may contribute to these discrepancies. Standardizing these definitions would aid in comparing results across different studies and in formulating more effective strategies for promoting healthy eating habits among children[7].

4. CONCLUSION

The results of this review may encourage future research on the influence of autonomy-supportive food parenting practices on children's food consumption. Furthermore, understanding the factors influencing food consumption and preferences can help refine public policies and health interventions to promote healthy eating habits from childhood. Ultimately, the benefits of healthy eating can be more effectively expanded when there is active involvement from parents, caregivers, and health professionals.

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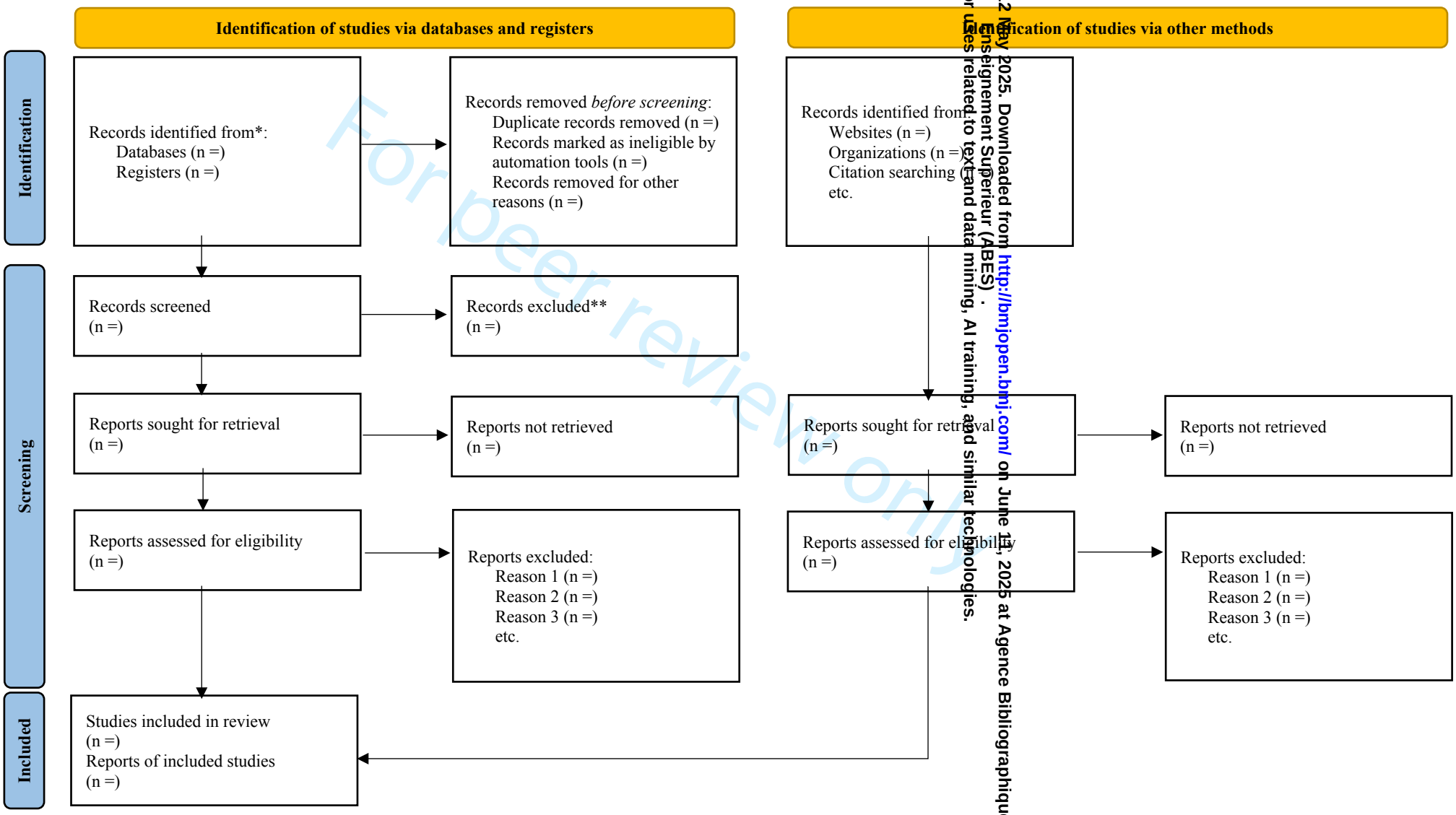
Figure 1 - PRISMA 2020 flow diagram for the identification, screening, and inclusion of studies in the review.



Supplementary File 1

PRISMA-P (Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols) 2015 checklist: recommended items to address in a systematic review protocol*

Section and topic	Item No	Checklist item	Information reported		Page
ADMINISTRATIVE INFORMATION			**Yes**	**No**	
Title:					
Identification	1a	Identify the report as a protocol of a systematic review	✓		1
Update	1b	If the protocol is for an update of a previous systematic review, identify as such		✓	N/A
Registration	2	If registered, provide the name of the registry (such as PROSPERO) and registration number	✓		3
Authors:					
Contact	3a	Provide name, institutional affiliation, e-mail address of all protocol authors; provide physical mailing address of corresponding author	✓		1
Contributions	3b	Describe contributions of protocol authors and identify the guarantor of the review	✓		1
Amendments	4	If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments		✓	N/A
Support:					
Sources	5a	Indicate sources of financial or other support for the review		✓	
Sponsor	5b	Provide name for the review funder and/or sponsor		✓	
Role of sponsor or funder	5c	Describe roles of funder(s), sponsor(s), and/or institution(s), if any, in developing the protocol		✓	
INTRODUCTION					

Rationale	6	Describe the rationale for the review in the context of what is already known		✓	2,3,4
Objectives	7	Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO)		✓	4
METHODS					
Eligibility criteria	8	Specify the study characteristics (such as PICO, study design, setting, time frame) and report characteristics (such as years considered, language, publication status) to be used as criteria for eligibility for the review	✓		Table 1, page 5
Information sources	9	Describe all intended information sources (such as electronic databases, contact with study authors, trial registers or other grey literature sources) with planned dates of coverage	✓		5,6
Search strategy	10	Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be repeated	✓		Table 2, page 6
Study records:					
Data management	11a	Describe the mechanism(s) that will be used to manage records and data throughout the review	✓		9,10
Selection process	11b	State the process that will be used for selecting studies (such as two independent reviewers) through each phase of the review (that is, screening, eligibility and inclusion in meta-analysis)	✓		9,10
Data collection process	11c	Describe planned method of extracting data from reports (such as piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators	✓		9,10
Data items	12	List and define all variables for which data will be sought (such as PICO items, funding sources), any pre-planned data assumptions and simplifications	✓		9,10

Outcomes and prioritization	13	List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale	✓		Table 1
Risk of bias in individual studies	14	Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis	✓		10
Data synthesis	15a	Describe criteria under which study data will be quantitatively synthesised			
	15b	If data are appropriate for quantitative synthesis, describe planned summary measures, methods of handling data and methods of combining data from studies, including any planned exploration of consistency (such as I^2, Kendall's τ)	✓		10
	15c	Describe any proposed additional analyses (such as sensitivity or subgroup analyses, meta-regression)			
	15d	If quantitative synthesis is not appropriate, describe the type of summary planned			
Meta-bias(es)	16	Specify any planned assessment of meta-bias(es) (such as publication bias across studies, selective reporting within studies)		✓	N/A
Confidence in cumulative evidence	17	Describe how the strength of the body of evidence will be assessed (such as GRADE)	✓		10,11

*** It is strongly recommended that this checklist be read in conjunction with the PRISMA-P Explanation and Elaboration (cite when available) for important clarification on the items. Amendments to a review protocol should be tracked and dated. The copyright for PRISMA-P (including checklist) is held by the PRISMA-P Group and is distributed under a Creative Commons Attribution Licence 4.0.**

From: Shamseer L, Moher D, Clarke M, Ghersi D, Liberati A, Petticrew M, Shekelle P, Stewart L, PRISMA-P Group. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: elaboration and explanation. BMJ. 2015 Jan 2;349(jan02 1):g7647.

SUPPLEMENTARY FILE 2

Database	Date	Search Strategy	Results
Pubmed	**24/06/2024**	Searches All Fields (("child" [Mesh] OR children OR preschool OR "child, preschool" [Mesh] OR "children, preschool" OR "preschool child" OR "preschool children" OR "preschool-aged child") AND ("Parenting" [Mesh] OR "Child Rearing" [Mesh] OR "food parenting" OR "parenting practices" OR "parental feeding practice" OR "parental feeding practices" OR "parenting feeding practice" OR "parent feeding practice" OR "parent feeding practices" OR "parental feeding practices" OR "maternal feeding practices" OR "food parenting practice" OR "food parenting practices" OR "parenting child-feeding practices" OR "parental child-feeding practices" OR "parental feeding behaviour" OR "parental feeding behaviours" OR "parental feeding behavior" OR "parental feeding behaviors" OR "feeding strategy" OR "feeding strategies" OR "parental feeding style" OR "parental feeding styles" OR "family feeding practices" OR "rearing child" OR "autonomy support" OR "autonomy promotion") AND ("eating" OR "food preferences" OR "fruit" OR "vegetables" OR "food intake" OR "dietary intake" OR "dietary intakes" OR "eating habits" OR "food preference" OR "healthy food" OR "healthy eating" OR "healthy intake" OR "food consumption" OR fruits OR vegetable))	**1816**
Scopus	**24/06/2024**	Searches TITLE-ABS-KEY ((children OR preschool OR "children, preschool" OR "preschool children" OR "preschool-aged child" OR preschoolers) AND ("Parenting" OR "Child Rearing" OR "food parenting" OR "parenting practices" OR "parental feeding practices" OR "parenting feeding practices" OR "parents feeding	**2946**

		practices" OR "maternal feeding practices" OR "food parenting practices" OR "parenting child-feeding practices" OR "parental child-feeding practices" OR "parental feeding behaviours" OR "feeding strategies" OR "parental feeding styles" OR "family feeding practices" OR "rearing child" OR "autonomy support" OR "autonomy promotion") AND ("eating" OR "food preferences" OR "fruit" OR "vegetables" OR "food intake" OR "dietary intakes" OR "eating habits" OR "food preference" OR "healthy food" OR "healthy eating" OR "healthy intake" OR "food consumption" OR fruits OR vegetable))	
Web of Science	**24/06/2024**	Searches title, abstract, keyword plus, and author keywords. (children OR preschool OR "child, preschool" OR "children, preschool" OR "preschool child" OR "preschool children" OR "preschool-aged child" OR preschoolers) AND ("Parenting" OR "Child Rearing" OR "food parenting" OR "parenting practices" OR "parental feeding practice" OR "parental feeding practices" OR "parenting feeding practices" OR "parent feeding practice" OR "parent feeding practices" OR "parents feeding practices" OR "maternal feeding practices" OR "food parenting practice" OR "food parenting practices" OR "parenting child-feeding practices" OR "parental child-feeding practices" OR "parental feeding behaviour" OR "parental feeding behaviours" OR "parental feeding behavior" OR "parental feeding behaviors" OR "feeding strategy" OR "feeding strategies" OR "parental feeding style" OR "parental feeding styles" OR "family feeding practices" OR "rearing child" OR "autonomy support" OR "autonomy promotion") AND ("eating" OR "food preferences" OR "fruit" OR "vegetables" OR "food intake" OR "dietary intake" OR "dietary intakes" OR "eating habits" OR "food preference" OR "healthy food" OR "healthy eating" OR "healthy intake" OR "food consumption" OR fruits OR vegetable)	**2063**

PsycoINFO	**24/06/2024**	Searches abstract ("child" OR children OR "children preschool" OR "Child, Preschool" OR "children preschool" OR "preschool child" OR "preschool children" OR "preschool-aged child" OR preschoolers) AND ("Parenting" OR "Child Rearing" OR "food parenting" OR "parenting practices" OR "parental feeding practice" OR "parental feeding practices" OR "parenting feeding practices" OR "parent feeding practice" OR "parent feeding practices" OR "parents feeding practices" OR "maternal feeding practices" OR "food parenting practice" OR "food parenting practices" OR "parenting child-feeding practices" OR "parental child-feeding practices" OR "parental feeding behaviour" OR "parental feeding behaviours" OR "parental feeding behavior" OR "parental feeding behaviors" OR "feeding strategy" OR "feeding strategies" OR "parental feeding style" OR "parental feeding styles" OR "family feeding practices" OR "rearing child" OR "autonomy support" OR "autonomy promotion") AND ("eating" OR "food preferences" OR "fruit" OR "vegetables" OR "food intake" OR "dietary intake" OR "dietary intakes" OR "eating habits" OR "food preference" OR "healthy food" OR "healthy eating" OR "healthy intake" OR "food consumption" OR fruits OR vegetable)	**925**
Embase	**24/06/2024**	Searches Title, Abstract or Author Keywords ("child" OR children OR "children preschool" OR "Child, Preschool" OR "children preschool" OR "preschool child" OR "preschool children" OR "preschool-aged child" OR preschoolers) AND ("Parenting" OR "Child Rearing" OR "food parenting" OR "parenting practices" OR "parental feeding practice" OR "parental feeding practices" OR "parenting feeding practices" OR "parent feeding practice" OR "parent feeding practices" OR "parents feeding practices" OR "maternal feeding practices" OR "food	**1824**

		parenting practice" OR "food parenting practices" OR "parenting child-feeding practices" OR "parental child-feeding practices" OR "parental feeding behaviour" OR "parental feeding behaviours" OR "parental feeding behavior" OR "parental feeding behaviors" OR "feeding strategy" OR "feeding strategies" OR "parental feeding style" OR "parental feeding styles" OR "family feeding practices" OR "rearing child" OR "autonomy support" OR "autonomy promotion") AND ("eating" OR "food preferences" OR "fruit" OR "vegetables" OR "food intake" OR "dietary intake" OR "dietary intakes" OR "eating habits" OR "food preference" OR "healthy food" OR "healthy eating" OR "healthy intake" OR "food consumption" OR fruits OR vegetable)	
Lilacs	**24/06/2024**	Searches Título, Reumo e Assunto ((criança) OR (crianças) OR (child) OR (pré-escolar) OR (pré-escolares) OR (“criança pré-escolar”) OR (“crianças pré-escolares”) OR (“child, preschool”) AND (“poder familiar”) OR (parenting) OR (parentalidade) OR (“práticas alimentares parentais”) OR (“práticas parentais”) OR (“práticas educativas alimentares”) OR (“práticas de parentalidade alimentar”) OR (“práticas de alimentação parental”) OR (“food parenting”) OR (“parenting practices”) OR (“parental feeding practice”) OR (“parental feeding practices”) OR (“food parenting practice”) OR (“food parenting practices”) OR (“autonomy support”) OR (“autonomy promotion”) OR (“parenting feeding practices”) OR (“parent feeding practice”) OR (“parent feeding practices”) OR (“parents feeding practices”) OR (“maternal feeding practices”) OR (“parenting child-feeding practices”) OR (“parental child-feeding practices”) OR (“parental feeding behavior”) OR (“parental feeding behaviors”) OR (“feeding strategy”) OR (“feeding strategies”) OR (“parental feeding style”) OR (“parental feeding styles”) OR (“family feeding practices”) OR (“child	**531**

		rearing") AND (frutas) OR (fruit) OR (fruits) OR (verduras) OR (hortaliças) OR (hortaliças) OR (vegetable)	

SUPPLEMENTARY FILE 3

Author, Year, Country	Study Design and Duration	Sample (Total Number (N), Age and Gender of Children and Caregivers)	Instrument Used to Assess Parental Feeding Practices	Assessed Autonomy Practices	Fruit and Vegetable Consumption Assessment (Method, Duration)	Confounding Variables	Main Results	Risk of Bias

BMJ Open

AUTONOMY AT THE TABLE - THE ROLE OF FOOD PARENTING PRACTICES IN CHILDREN'S FRUIT AND VEGETABLE CONSUMPTION: A SYSTEMATIC REVIEW AND META-ANALYSIS PROTOCOL

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2024-094969.R1
Article Type:	Protocol
Date Submitted by the Author:	07-Apr-2025
Complete List of Authors:	Lopes, Elisama; Federal University of Goias Vilella, Priscylla ; UFG, Faculty of Nutrition Moreira, Paula; UFRGS, Faculdade de Medicina Noll, Matias; Instituto Federal Goiano, Public Health de Almeida, Gessica; UFG Martins, Karine ; UFG
Primary Subject Heading:	Nutrition and metabolism
Secondary Subject Heading:	Evidence based practice, Health policy, Nutrition and metabolism
Keywords:	Parents, Child, Health, Family

AUTONOMY AT THE TABLE - THE ROLE OF FOOD PARENTING PRACTICES IN CHILDREN'S FRUIT AND VEGETABLE CONSUMPTION: A SYSTEMATIC REVIEW AND META-ANALYSIS PROTOCOL

ABSTRACT

Objectives: Despite parents' efforts, many children have nutrient-poor diets with insufficient fruit and vegetable consumption. Parents significantly influence children's eating habits at home through their food parenting practices. Although there are systematic reviews on parental feeding practices, they were published some time ago, so it is timely to investigate the relationship between autonomy-supportive practices and fruit and vegetable consumption in children aged 2 to 12 years.

Design: Systematic review and meta-analysis protocol conducted in accordance with PRISMA-P guidelines.

Data sources: PubMed®, Scopus™, Web of Science™, PsycINFO®, EMBASE®, LILACS® databases, and Google Scholar®, with no restrictions on publication year, country, or language. In addition to the databases, the search will be complemented by manual searches of reference lists from the included articles.

Eligibility criteria: Articles that evaluated at least one parental autonomy-supportive feeding practice and its relationship with fruit and vegetable consumption in healthy children aged two to twelve years will be included.

Data synthesis and risk of bias: The results will be systematically categorized and presented in tables and figures for clarity. If the data allows, a meta-analysis will be conducted. The risk of bias will be assessed using tools from the Joanna Briggs Institute, ensuring rigorous evaluation of study quality. Any disagreements between reviewers will be resolved by a third reviewer to maintain consistency and accuracy in the analysis.

Discussion: This review and meta-analysis will be important for understanding the influence of parental autonomy-supportive feeding practices on children's fruit and vegetable consumption, potentially informing public policies and health practices that promote healthy eating habits from childhood.

PROSPERO registration number: CRD42023442680.

Keywords: Feeding practice, Parenting, Children, Dietary intake, Fruits, Vegetables

STRENGTHS AND LIMITATIONS

⇒ The review will be conducted rigorously and transparently with a systematic review specialist.

⇒ A rigorous bias risk assessment will be incorporated using tools from the Joanna Briggs Institute.

⇒ The review will focus on identifying practices that may promote fruit and vegetable consumption.

⇒ Self-reported tools used in the included studies may introduce social desirability bias.

⇒ Studies conducted in Western populations may limit the generalization of results to other cultures.

1. INTRODUCTION

Despite parents' and families' efforts to provide adequate and healthy nutrition, many children still have nutrient-poor diets[1]. In 2019, according to the report The State of the World's Children[2], two out of five children did not consume fruits or vegetables, thus missing out on the essential nutritional benefits of these foods. At the same time, the consumption of processed snacks and beverages among young children is high, contributing to the early development of overweight and obesity[2].

Fruits and vegetables are nutrient-rich foods that provide vitamins, minerals, dietary fibers, and antioxidants. They should be introduced early in a child's diet and offered regularly[1]. The World Health Organization (WHO) recommends a daily intake of 400 grams (five servings) of fruits and vegetables to promote adequate health[3]. A diverse diet supports healthy growth and development throughout life and reduces the risk of non-communicable chronic diseases (NCDs), contributing to lower mortality rates from these conditions[3,4].

The home environment is fundamental to a child's physical, cognitive, social, and emotional development[5,6]. Particularly in the context of nutrition, parents significantly influence the formation of eating habits and preferences through their actions and behaviors. In the scientific literature, these behaviors are referred to as food parenting practices. Food parental practices encompass the behaviors and actions, whether intentional or not, that parents engage in within the realm of feeding their children, with the aim of shaping their attitudes, behaviors, and beliefs[7].

According to the model proposed by Vaughn et al. (2016)[7] and aligned with Self-Determination Theory (SDT)[8], food parenting practices are divided into three main categories: coercive control, structure, and autonomy support. Coercive control practices in the context of feeding include pressure to eat, food restriction, threats and bribes, and using rewards to influence children's behavior. The structure involves organizing the food environment, setting and communicating clear and consistent rules, meal setup, and family eating habits. The autonomy support involves nutritional education, child involvement in food acquisition and preparation, encouragement, praise, reasoning, and negotiation[7].

Studies have shown that structure and autonomy-support practices are associated with positive outcomes in children's health, while coercive control practices are linked to negative consequences. However, the study results were heterogeneous or sometimes did not reach statistical significance[7,9,10]. Three reviews published between 2016 and 2017 suggested that this inconsistency may be attributed to the fact that contextual variables (e.g., parenting style and family structure) and individual factors (e.g., temperament and eating behavior) are not uniformly controlled across studies or to the lack of clarity in the definitions used to describe parental practices[7,9,10].

Although some systematic reviews have investigated the relationship between food parenting practices and children's eating habits[9,10], these reviews were published some time ago and primarily focused on coercive control and structure practices. There has been growing interest in studying food parenting practices in recent years. In this regard, there remains a gap in the literature, particularly concerning the investigation of the relationship between autonomy-supportive feeding practices and children's eating habits. This systematic review and meta-analysis aims to fill this gap by examining and synthesizing the available evidence on the relationship between autonomy-supportive food parenting practices, as defined by the model proposed by Vaughn et al. (2016)[7], and fruit and vegetable consumption in children aged two to twelve years. Herein, we present the study protocol.

2. MATERIALS AND METHODS

2.1. Protocol and Registration

This review and meta-analysis protocol was developed following the guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses for Protocols 2015 (PRISMA-P 2015)[11,12] (Supplemental Table 1). To ensure transparency and reproducibility, and

to avoid duplicating efforts on the same research topic, the protocol was submitted and registered with the International Prospective Register of Systematic Reviews (PROSPERO) under registration number CRD42023442680. Any changes to this protocol during the study will be updated in the PROSPERO registry and described in the final manuscript.

2.2. Information Sources and Search Strategy

The Population, Intervention or Exposure, Comparison, Outcomes, and Study Design - PICOS acronym[13] (Table 1) was used to formulate the research question*: "Is there a relationship between autonomy-supportive parental feeding practices and fruit and vegetable consumption in children aged two to twelve years?"* This age range was chosen to align with the definition of children as outlined in Job et al[14]. Furthermore, studies examining food parenting practices among child caregivers often cover a broad age range, including early and middle childhood, which can make it challenging to distinguish clearly between age groups. This review will focus on children, as this is the period when the home environment strongly influences the formation of eating habits, shaping children's attitudes and perceptions of food.

Table 1 - PICOS Criteria for Study Inclusion

Parameter	Inclusion Criteria	Exclusion Criteria
Population	Caregivers or primary guardians of healthy children aged two to twelve years.	Caregivers of children with conditions that may affect feeding (e.g., celiac disease, food allergies, food intolerances, autism spectrum disorder, Down syndrome, diabetes).
Intervention or Exposure	Evaluated at least one parental autonomy-supportive feeding practice and used validated instruments or tools with verified internal consistency of items. Patterns or profiles that only included autonomy-supportive practices will be included in this review.	Studies that used statistical approaches to combine parental practices from multiple domains into a single variable, i.e., evaluating patterns/profiles of parental practices.
Comparison	Not applicable	Not applicable
Outcome	Evaluated fruit and/or vegetable consumption through dietary frequency questionnaires, food diaries, and/or direct food weighing, or assessed preferences for these foods.	Evaluated combined fruit and vegetable consumption within a single dependent variable category or assessed fruits and vegetables as separate measures. Studies that combined fruit and vegetable consumption with other types of foods.
Study Type	Observational studies (cross-sectional, cohort, case-control). Intervention studies (randomized clinical trials and experimental studies).	Studies with missing and/or unclear data, even after requesting information from authors, letters, reviews, conference abstracts, opinion pieces, case reports, poster presentations, news summaries, theses, and dissertations.

The following databases will be consulted to identify relevant studies: PubMed® (National Library of Medicine), Scopus™ (Elsevier), Web of Science™ Core Collection (Clarivate Analytics), PsycINFO® (American Psychological Association), EMBASE® (Elsevier), and LILACS® (BIREME). A limited search of the first 100 records will also be conducted in Google Scholar®. Searches in for PubMed® will cover all fields, while searches in the other databases will be performed on titles, abstracts, and keywords. Secondary searches will include reviewing the reference lists of included studies and relevant systematic reviews. Additionally, if information is lacking, the authors of the articles will be contacted.

Indexed terms and their synonyms were used to identify all relevant articles with boolean operators. The "OR" operator combined similar terms, broadening the scope of each search strategy. The blocks of terms were then combined using the "AND" operator. Searches were conducted in the databases without restrictions on year, country, or publication language. Following the recommendations of Greenhalgh and Peacock (2005)[15], systematic review team experts were consulted to refine the search strategy. Table 2 details the structure of the overall search strategy, including the descriptors and boolean operators used in the databases. Specific search strategies for each database can be found in Supplemental Table 2. All studies meeting this review's eligibility criteria (Table 1) will be included. The review will start in May 2023 and is expected to be completed in May 2025.

Table 2 - Keywords used in the search strategy grouped into blocks.

Block (PICO)	
# 1 P	(1) child OR children OR preschool OR "child, preschool" OR "children, preschool" OR "preschool child" OR "preschool children" OR "preschool-aged child" OR preschoolers
# 2 I	(2) parenting OR "child rearing" OR "food parenting" OR "parenting practices" OR "parental feeding practice" OR "parental feeding practices" OR "parenting feeding practices" OR "parent feeding practice" OR "parent feeding practices" OR "parents feeding practices" OR "maternal feeding practices" OR "food parenting practice" OR "food parenting practices" OR "parenting child-feeding practices" OR "parental child-feeding practices" OR "parental feeding behaviour" OR "parental feeding behaviours" OR "parental feeding behavior" OR "parental feeding behaviors" OR "feeding strategy" OR "feeding strategies" OR "parental feeding style" OR "parental feeding styles" OR "family feeding practices" OR "rearing child" OR "autonomy support" OR "autonomy promotion"
# 3 O	(3) eating OR "food preferences" OR fruit OR vegetables OR "food intake" OR "dietary intake" OR "dietary intakes" OR "eating habits" OR "food preference" OR "healthy food" OR "healthy eating" OR "healthy intake" OR "food consumption" OR fruits OR vegetable
Search Strategy	(#1) AND (#2) AND (#3)

Note: "P" stands for Population, "I" refers to Intervention or Exposure, and "O" represents Outcome.

2.3. Eligibility Criteria

The eligibility criteria are detailed in Table 1, with no restrictions on publication year, country, or language. All included articles will be checked for possible retractions. Eligible studies for the systematic review will be rigorously examined, including the use of Scite – an acronym for "Smart Citation Index," available online (https://scite.ai/) – to confirm the validity of the evidence and identify any retraction records. Scite is a research tool that offers an innovative way to verify, assess, and contextualize citations of scientific articles. Among its various features, Scite checks if a specific article has been retracted or contested, thus ensuring the integrity of the sources used[16].

2.4. Study Selection Process

The identified articles will be selected, and their metadata will be transferred to Zotero 6.0 (Corporation for Digital Scholarship, VA, Fairfax) in RIS format, where duplicates will be identified and removed. The metadata will then be imported into Rayyan® (available online at https://www.rayyan.ai/)[17], a software specifically designed for systematic reviews, with the reviewer blinding feature enabled for evaluation.

In Rayyan®, the initial screening and selection of studies will be conducted by reading titles and abstracts to check compliance with inclusion criteria. Two independent reviewers (ECL and PRV) will perform this screening. A third researcher (PRM) will resolve any discrepancies between reviewers. In the subsequent phase, the same two reviewers will read the full text of the remaining articles to confirm eligibility. Discrepancies between reviewers during this phase will also be resolved by the third reviewer (PRM). Finally, articles deemed eligible will be included in this systematic review. The flowchart of the study selection process for this review is illustrated in Figure 1, using a model recommended by PRISMA 2020.

Conducting the review with independent reviewers and blinding is crucial to minimize the likelihood of individual biases that may influence the review results. This increases the impartiality and objectivity of the analysis. Additionally, using independent and parallel reviewers allows for comparing assessments made by different reviewers. In this regard, reliability (Cohen's kappa coefficient, denoted as κ) and agreement (agreement ratio) between reviewers will be measured, increasing confidence in the results obtained, using R software version 4.3.3 (R Foundation, Vienna, Austria). The κ coefficient ranges from -1 to 1, reflecting different levels of agreement between reviewers. A value of $0 < \kappa \leq 0.20$ indicates no agreement; $0.21 < \kappa \leq 0.39$ indicates minimal agreement; $0.40 < \kappa \leq 0.59$ indicates weak agreement; $0.60 < \kappa \leq 0.79$ indicates moderate agreement; $0.80 < \kappa \leq 0.90$ indicates strong agreement; and ≥ 0.90 indicates almost perfect agreement[18].

2.5. Data Extraction, Synthesis, and Analysis

Data will be extracted, assessed, and synthesized independently and blindly by the same two reviewers (ECL and PRV). Any discrepancies will be resolved by the third reviewer (PRM), if necessary. An extraction spreadsheet has been developed with the support of experts from the team, and it includes information such as publication details (authors, year, country), study type, participant characteristics (age, sex, sample size), autonomy-supportive practices evaluated, instruments used, methods of dietary intake assessment, confounding variables, and key results (Supplemental Table 3).

In addition to the aforementioned descriptive synthesis, this review will consider performing a quantitative synthesis through meta-analysis if the quantitative data from our investigation allows for it. Regression coefficients and Pearson and Spearman correlation coefficients, as available in the included studies, will be used to estimate the association between parental feeding practices and children's fruit and vegetable consumption. The meta-analysis will calculate the weighted average of the regression and correlation coefficients to estimate the association's average effect, considering each study's sample weight.

Statistical methods will be applied to assess the heterogeneity among studies, using the I^2 statistic to quantify variability among study results and categorize heterogeneity as mild (25–50%), moderate (50–75%), or severe (>75%)[19]. The analysis will be conducted with a 95% confidence interval. Additionally, if two or more studies report results or information on the same data, the study with the largest number of participants will be considered.

To explore potential variations in the effects, subgroup analyses will be conducted, stratifying the studies by country of origin, children's age group, reporting perspective (whether reported by parents or children), method of parental feeding practice assessment, and dietary intake assessment[16]. Additionally, a sensitivity analysis will be performed to evaluate the robustness of the results, considering the influence of potential sources of bias and variability in the data. The results will be objectively categorized and, if necessary, subcategorized. These findings will be presented clearly and concisely through figures, diagrams, or other appropriate graphical elements to illustrate patterns, trends, and outcomes[20].

In addition to the aforementioned statistical analyses, a funnel plot will be used to assess publication bias among the included studies. This plot is useful for visualizing the distribution of studies according to effect size and precision. Asymmetry in the funnel plot may indicate publication bias, where studies with positive or significant results are more likely to be published compared to studies with negative or non-significant results[21]. All statistical analyses will be conducted in R Studio version 4.3.4 (RStudio, Boston, MA), using two-sided P-values.

2.6. Methodological Quality Assessment

The same two reviewers mentioned previously (ECL and PRV) will assess the risk of bias in eligible articles using the Joanna Briggs Institute tools according to the relevant study types (Joanna Briggs Institute, 2022, available at https://jbi.global/critical-appraisal-tools).[22] Each article will be evaluated using the corresponding checklist, with responses categorized as "Yes" if the criterion is met, "No" if not met, "Unclear" if the information is not clear in the article, and "NA" if not applicable. In case of disagreements, the third reviewer (PRM) will be consulted to resolve discrepancies. The risk of bias will be determined based on a recent systematic review that also used the Joanna Briggs Institute checklists[23]. The articles will be classified into three levels of risk of bias: high, when the proportion of "yes" responses was up to 65%; moderate, when the proportion was above 65% and less than 87.5%; and low, when it was equal to or greater than 87.5%[23].

2.7. Reviewer Training

Reviewers assessing study eligibility will undergo training on inclusion and exclusion criteria, with the training conducted by the author specializing in systematic review (G. M. A.).

They will also receive training on bias risk assessment tools and data extraction spreadsheets. Moreover, the training process covered how to correctly use the Rayyan software and standardize procedures too.

2.8. Ethics and Dissemination

Ethical approval is not required for this type of study. The results will be submitted for publication in a peer-reviewed journal.

3. DISCUSSION

Food plays a fundamental role in a child's life from the earliest moments[24]. In the intrauterine environment, the food environment already significantly influences the individual's development through early exposure to smells and flavors, which can impact the child's food preferences[25]. However, the influence of food goes beyond this. Ecological models recognize that multiple factors shape the development of eating habits and preferences[24]. These factors range from proximal contextual aspects, such as food parenting practices, to more distal influences, including external factors beyond the family environment, such as school, peers, and access to food outside the home[24].

It is important to highlight that these factors do not act in isolation but interact. In this sense, family demographic characteristics such as race, ethnicity, education level, income, and food security can influence the food practices parents adopt, which, in turn, impact children's food preferences and consumption[7]. This review not only aims to assess the relationship between food parenting practices, particularly autonomy-supportive ones, and children's fruit and vegetable consumption but also to explore what these factors have been addressed in existing studies.

Regarding food parenting practices, scientific literature has shown that non-responsive parenting practices negatively affect children's health[7]. These practices involve parents not adequately responding to their children's hunger and satiety cues[26]. Strategies such as pressuring children to eat, to clean their plates, or imposing food restrictions can lead to negative relationships with food, resulting in reduced acceptance of healthy foods, increased preference for restricted foods, and the potential development of disordered eating patterns[7]. Food restriction is associated with higher Body Mass Index (BMI), while pressure to eat is associated with lower BMI, particularly in cross-sectional studies[27].

On the other hand, responsive feeding practices, such as autonomy-supportive practices where parents appropriately and positively respond to children's hunger and satiety cues, have been associated with more favorable outcomes[7,26]. According to Vaughn et al. (2016)[7], these autonomy-supportive practices include various strategies that encourage children's self-determination. For example, involving children in meal preparation is one such practice, allowing them to learn about food and to develop cooking skills early. Encouraging the exploration of new foods, such as fruits and vegetables, and teaching nutrition according to the child's age helps increase their awareness about the importance of balanced eating. Additionally, praising children for making healthy food choices reinforces positive behaviors.

However, scientific literature shows some inconsistencies in results, which may be attributed to contextual (e.g., family structure and parenting style) and individual variations (e.g., temperament and eating behavior) that are not adequately controlled[7,10]. Moreover, some studies lack clarity in defining food parenting practices, which may contribute to these discrepancies. Standardizing these definitions would aid in comparing results across different studies and in formulating more effective strategies for promoting healthy eating habits among children[7].

4. STRENGTHS AND LIMITATIONS

This systematic review protocol has several strengths. First, the future review, conducted with rigor and transparency, is expected to identify gaps in the existing literature, encouraging further research to deepen the understanding of parental feeding practices and their impact on child health. By investigating the relationship between parental feeding practices and children's consumption, the review may promote healthy eating habits from an early age, with potential long-term effects on an individual's life. Additionally, the results may identify more effective food parenting practices for encouraging fruit and vegetable consumption, providing important evidence to guide healthcare professionals and child caregivers. The findings may support the development of programs and interventions that promote feeding practices that are more responsive to children's needs. The subgroup analysis is likely feasible, as it enhances the understanding of result consistency and the factors influencing the findings, such as contextual and methodological differences between studies. Finally, the review may be relevant for informing public policies and health programs to improve child health.

However, some limitations are expected. Firstly, the tools used to assess parental practices and food consumption are often self-reported, which increases the likelihood of social desirability bias. Secondly, most studies may be cross-sectional, preventing causal inferences between variables. Thirdly, heterogeneity in the definitions and methodologies of the included studies may complicate the comparison and synthesis of results. Fourthly, as observed in other reviews[9,10], most studies on parental feeding practices are limited to Western populations. Since culture can influence parent-child relationships, the findings may not be generalized to other cultures. Finally, as the aim of this review is to conduct a meta-analysis, subgroup analysis may provide important insights into contextual and methodological variations, allowing for a more robust interpretation of the findings.

5. CONCLUSION

The results of this review may encourage future research on the influence of autonomy-supportive food parenting practices on children's food consumption. Furthermore, understanding the factors influencing food consumption and preferences can help refine public policies and health interventions to promote healthy eating habits from childhood. Ultimately, the benefits of healthy eating can be more effectively expanded when there is active involvement from parents, caregivers, and health professionals.

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Contributorship Statement: ECL and PRV are mainly responsible for the protocol writing. GMA, MN and KAM are mainly responsible for the design and revision of the protocol. ECL and PRV will be mainly responsible for study selection. ECL and PRV will be mainly responsible for charting data. ECL, PRV and PRM will be responsible for reporting results. ECL, PRV and PRM will be responsible for the discussion. KAM is responsible for the guidance of the whole study and is the guarantor. All authors contributed to the article and approved the submitted version.

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Competing interests: The authors declare that no financial or personal interests could influence the results of this research.

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Patient consent for publication: This manuscript does not contain personal or medical information about any identifiable individual.

Ethics approval: This study does not require ethical committee approval as it involves a review of existing literature and does not include primary data collection involving human subjects.

Data availability statement: All data relevant to the study are included in the article or uploaded as supplementary information.

AI Technology Used: The AI technologies used were ChatGPT® and Grammarly®.

Reason for Use: These AI tools were employed to detect writing errors, cohesion issues, and grammar problems, aiming to improve the text's clarity and flow.

How the AI Technology Was Used: The AI tools were used to review the manuscript, identifying grammatical errors and issues of cohesion. The goal was to ensure that the text was clear and cohesive.

AI Input and Output:

- Input: The manuscript text was provided as input to the AI tools.
- Output: The tools provided suggestions for grammatical corrections, cohesion adjustments, and improvements to sentence structure, which were reviewed by the authors.

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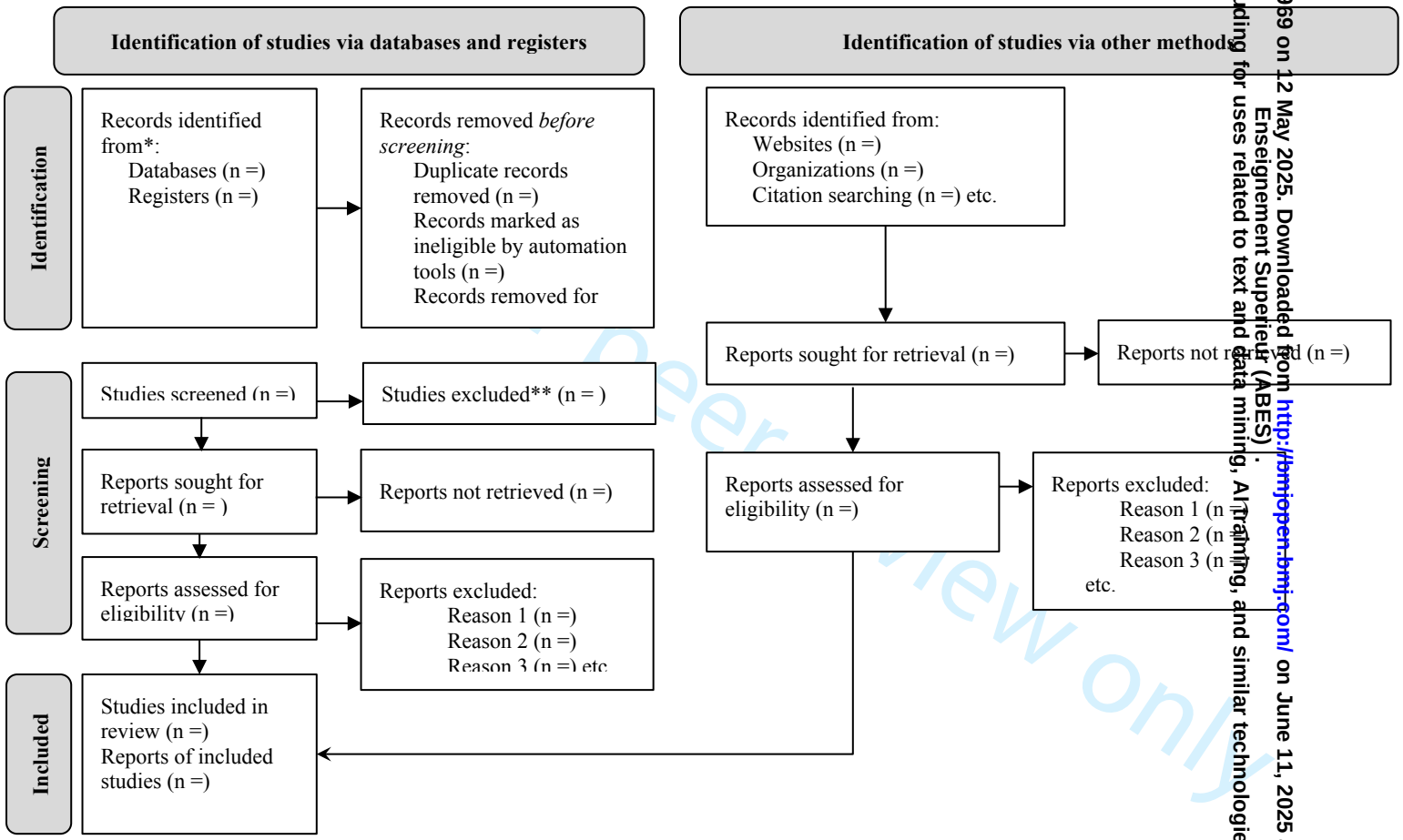
Figure 1 - PRISMA 2020 flow diagram for the identification, screening, and inclusion of studies in the review.

*Consider, if feasible to do so, reporting the number of records identified from each database or register searched (rather than the total number across all databases/registers).
**If automation tools were used, indicate how many records were excluded by a human and how many were excluded by automation tools.
Source: Page MJ, et al. BMJ 2021;372:n71. doi: 10.1136/bmj.n71.



*Consider, if feasible to do so, reporting the number of records identified from each database or register searched (rather than the total number across all databases/registers).
**If automation tools were used, indicate how many records were excluded by a human and how many were excluded by automation tools.
Source: Page MJ, et al. BMJ 2021;372:n71. doi: 10.1136/bmj.n71.

Figure 1 - PRISMA 2020 flow diagram for the identification, screening, and inclusion of studies in the review.

SUPPLEMENTAL TABLE 1

PRISMA-P (Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols) 2015 checklist: recommended items to address in a systematic review protocol*

Section and topic	Item No	Checklist item	Information reported		Page
ADMINISTRATIVE INFORMATION			**Yes**	**No**	
Title:					
Identification	1a	Identify the report as a protocol of a systematic review	✓		1
Update	1b	If the protocol is for an update of a previous systematic review, identify as such		✓	N/A
Registration	2	If registered, provide the name of the registry (such as PROSPERO) and registration number	✓		3
Authors:					
Contact	3a	Provide name, institutional affiliation, e-mail address of all protocol authors; provide physical mailing address of corresponding author	✓		1
Contributions	3b	Describe contributions of protocol authors and identify the guarantor of the review	✓		1
Amendments	4	If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments		✓	N/A
Support:					
Sources	5a	Indicate sources of financial or other support for the review		✓	
Sponsor	5b	Provide name for the review funder and/or sponsor		✓	
Role of sponsor or funder	5c	Describe roles of funder(s), sponsor(s), and/or institution(s), if any, in developing the protocol		✓	
INTRODUCTION					

Rationale	6	Describe the rationale for the review in the context of what is already known		✓	1,2,3
Objectives	7	Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO)		✓	3
METHODS					
Eligibility criteria	8	Specify the study characteristics (such as PICO, study design, setting, time frame) and report characteristics (such as years considered, language, publication status) to be used as criteria for eligibility for the review	✓		Tabela 1, pág 6
Information sources	9	Describe all intended information sources (such as electronic databases, contact with study authors, trial registers or other grey literature sources) with planned dates of coverage	✓		6
Search strategy	10	Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be repeated	✓		Pág 4, tabela 2
Study records:					
Data management	11a	Describe the mechanism(s) that will be used to manage records and data throughout the review	✓		6,7
Selection process	11b	State the process that will be used for selecting studies (such as two independent reviewers) through each phase of the review (that is, screening, eligibility and inclusion in meta-analysis)	✓		6,7
Data collection process	11c	Describe planned method of extracting data from reports (such as piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators	✓		6,7
Data items	12	List and define all variables for which data will be sought (such as PICO items, funding sources), any pre-planned data assumptions and simplifications	✓		6,7

Outcomes and prioritization	13	List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale	✓		Table 1
Risk of bias in individual studies	14	Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis	✓		8
Data synthesis	15a	Describe criteria under which study data will be quantitatively synthesised			
	15b	If data are appropriate for quantitative synthesis, describe planned summary measures, methods of handling data and methods of combining data from studies, including any planned exploration of consistency (such as I^2, Kendall's τ)	✓		8
	15c	Describe any proposed additional analyses (such as sensitivity or subgroup analyses, meta-regression)			
	15d	If quantitative synthesis is not appropriate, describe the type of summary planned			
Meta-bias(es)	16	Specify any planned assessment of meta-bias(es) (such as publication bias across studies, selective reporting within studies)		✓	N/A
Confidence in cumulative evidence	17	Describe how the strength of the body of evidence will be assessed (such as GRADE)		✓	8

*** It is strongly recommended that this checklist be read in conjunction with the PRISMA-P Explanation and Elaboration (cite when available) for important clarification on the items. Amendments to a review protocol should be tracked and dated. The copyright for PRISMA-P (including checklist) is held by the PRISMA-P Group and is distributed under a Creative Commons Attribution Licence 4.0.**

From: Shamseer L, Moher D, Clarke M, Ghersi D, Liberati A, Petticrew M, Shekelle P, Stewart L, PRISMA-P Group. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: elaboration and explanation. BMJ. 2015 Jan 2;349(jan02 1):g7647.

SUPPLEMENTAL TABLE 2

Database	Date	Search Strategy	Results
Pubmed	**24/06/2024**	Searches All Fields (("child" [Mesh] OR children OR preschool OR "child, preschool" [Mesh] OR "children, preschool" OR "preschool child" OR "preschool children" OR "preschool-aged child") AND ("Parenting" [Mesh] OR "Child Rearing" [Mesh] OR "food parenting" OR "parenting practices" OR "parental feeding practice" OR "parental feeding practices" OR "parenting feeding practice" OR "parent feeding practice" OR "parent feeding practices" OR "parental feeding practices" OR "maternal feeding practices" OR "food parenting practice" OR "food parenting practices" OR "parenting child-feeding practices" OR "parental child-feeding practices" OR "parental feeding behaviour" OR "parental feeding behaviours" OR "parental feeding behavior" OR "parental feeding behaviors" OR "feeding strategy" OR "feeding strategies" OR "parental feeding style" OR "parental feeding styles" OR "family feeding practices" OR "rearing child" OR "autonomy support" OR "autonomy promotion") AND ("eating" OR "food preferences" OR "fruit" OR "vegetables" OR "food intake" OR "dietary intake" OR "dietary intakes" OR "eating habits" OR "food preference" OR "healthy food" OR "healthy eating" OR "healthy intake" OR "food consumption" OR fruits OR vegetable))	**1816**
Scopus	**24/06/2024**	Searches TITLE-ABS-KEY ((children OR preschool OR "children, preschool" OR "preschool children" OR "preschool-aged child" OR preschoolers) AND ("Parenting" OR "Child Rearing" OR "food parenting" OR "parenting practices" OR "parental feeding practices" OR "parenting feeding practices" OR "parents feeding	**2946**

		practices" OR "maternal feeding practices" OR "food parenting practices" OR "parenting child-feeding practices" OR "parental child-feeding practices" OR "parental feeding behaviours" OR "feeding strategies" OR "parental feeding styles" OR "family feeding practices" OR "rearing child" OR "autonomy support" OR "autonomy promotion") AND ("eating" OR "food preferences" OR "fruit" OR "vegetables" OR "food intake" OR "dietary intakes" OR "eating habits" OR "food preference" OR "healthy food" OR "healthy eating" OR "healthy intake" OR "food consumption" OR fruits OR vegetable))	
Web of Science	**24/06/2024**	Searches title, abstract, keyword plus, and author keywords. (children OR preschool OR "child, preschool" OR "children, preschool" OR "preschool child" OR "preschool children" OR "preschool-aged child" OR preschoolers) AND ("Parenting" OR "Child Rearing" OR "food parenting" OR "parenting practices" OR "parental feeding practice" OR "parental feeding practices" OR "parenting feeding practices" OR "parent feeding practice" OR "parent feeding practices" OR "parents feeding practices" OR "maternal feeding practices" OR "food parenting practice" OR "food parenting practices" OR "parenting child-feeding practices" OR "parental child-feeding practices" OR "parental feeding behaviour" OR "parental feeding behaviours" OR "parental feeding behavior" OR "parental feeding behaviors" OR "feeding strategy" OR "feeding strategies" OR "parental feeding style" OR "parental feeding styles" OR "family feeding practices" OR "rearing child" OR "autonomy support" OR "autonomy promotion") AND ("eating" OR "food preferences" OR "fruit" OR "vegetables" OR "food intake" OR "dietary intake" OR "dietary intakes" OR "eating habits" OR "food preference" OR "healthy food" OR "healthy eating" OR "healthy intake" OR "food consumption" OR fruits OR vegetable)	**2063**

PsycoINFO	**24/06/2024**	Searches abstract ("child" OR children OR "children preschool" OR "Child, Preschool" OR "children preschool" OR "preschool child" OR "preschool children" OR "preschool-aged child" OR preschoolers) AND ("Parenting" OR "Child Rearing" OR "food parenting" OR "parenting practices" OR "parental feeding practice" OR "parental feeding practices" OR "parenting feeding practices" OR "parent feeding practice" OR "parent feeding practices" OR "parents feeding practices" OR "maternal feeding practices" OR "food parenting practice" OR "food parenting practices" OR "parenting child-feeding practices" OR "parental child-feeding practices" OR "parental feeding behaviour" OR "parental feeding behaviours" OR "parental feeding behavior" OR "parental feeding behaviors" OR "feeding strategy" OR "feeding strategies" OR "parental feeding style" OR "parental feeding styles" OR "family feeding practices" OR "rearing child" OR "autonomy support" OR "autonomy promotion") AND ("eating" OR "food preferences" OR "fruit" OR "vegetables" OR "food intake" OR "dietary intake" OR "dietary intakes" OR "eating habits" OR "food preference" OR "healthy food" OR "healthy eating" OR "healthy intake" OR "food consumption" OR fruits OR vegetable)	**925**
Embase	**24/06/2024**	Searches Title, Abstract or Author Keywords ("child" OR children OR "children preschool" OR "Child, Preschool" OR "children preschool" OR "preschool child" OR "preschool children" OR "preschool-aged child" OR preschoolers) AND ("Parenting" OR "Child Rearing" OR "food parenting" OR "parenting practices" OR "parental feeding practice" OR "parental feeding practices" OR "parenting feeding practices" OR "parent feeding practice" OR "parent feeding practices" OR "parents feeding practices" OR "maternal feeding practices" OR "food	**1824**

		parenting practice" OR "food parenting practices" OR "parenting child-feeding practices" OR "parental child-feeding practices" OR "parental feeding behaviour" OR "parental feeding behaviours" OR "parental feeding behavior" OR "parental feeding behaviors" OR "feeding strategy" OR "feeding strategies" OR "parental feeding style" OR "parental feeding styles" OR "family feeding practices" OR "rearing child" OR "autonomy support" OR "autonomy promotion") AND ("eating" OR "food preferences" OR "fruit" OR "vegetables" OR "food intake" OR "dietary intake" OR "dietary intakes" OR "eating habits" OR "food preference" OR "healthy food" OR "healthy eating" OR "healthy intake" OR "food consumption" OR fruits OR vegetable)	
Lilacs	**24/06/2024**	Searches Título, Reumo e Assunto ((criança) OR (crianças) OR (child) OR (pré-escolar) OR (pré-escolares) OR (“criança pré-escolar”) OR (“crianças pré-escolares”) OR (“child, preschool”) AND (“poder familiar”) OR (parenting) OR (parentalidade) OR (“práticas alimentares parentais”) OR (“práticas parentais”) OR (“práticas educativas alimentares”) OR (“práticas de parentalidade alimentar”) OR (“práticas de alimentação parental”) OR (“food parenting”) OR (“parenting practices”) OR (“parental feeding practice”) OR (“parental feeding practices”) OR (“food parenting practice”) OR (“food parenting practices”) OR (“autonomy support”) OR (“autonomy promotion”) OR (“parenting feeding practices”) OR (“parent feeding practice”) OR (“parent feeding practices”) OR (“parents feeding practices”) OR (“maternal feeding practices”) OR (“parenting child-feeding practices”) OR (“parental child-feeding practices”) OR (“parental feeding behavior”) OR (“parental feeding behaviors”) OR (“feeding strategy”) OR (“feeding strategies”) OR (“parental feeding style”) OR (“parental feeding styles”) OR (“family feeding practices”) OR (“child	**531**

		rearing") AND (frutas) OR (fruit) OR (fruits) OR (verduras) OR (hortaliças) OR (hortaliças) OR (vegetable)	

SUPPLEMENTAL TABLE 3

Author, Year, Country	Study Design and Duration	Sample (Total Number (N), Age and Gender of Children and Caregivers)	Instrument Used to Assess Parental Feeding Practices	Assessed Autonomy Practices	Fruit and Vegetable Consumption Assessment (Method, Duration)	Confounding Variables	Main Results	Risk of Bias

BMJ Open

AUTONOMY AT THE TABLE - THE ROLE OF FOOD PARENTING PRACTICES IN CHILDREN'S FRUIT AND VEGETABLE CONSUMPTION: A SYSTEMATIC REVIEW AND META-ANALYSIS PROTOCOL

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2024-094969.R2
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Date Submitted by the Author:	18-Apr-2025
Complete List of Authors:	Lopes, Elisama; Federal University of Goias Vilella, Priscylla ; UFG, Faculty of Nutrition Moreira, Paula; UFRGS, Faculdade de Medicina Noll, Matias; Instituto Federal Goiano, Public Health de Almeida, Gessica; UFG Martins, Karine ; UFG
Primary Subject Heading:	Nutrition and metabolism
Secondary Subject Heading:	Evidence based practice, Health policy, Nutrition and metabolism
Keywords:	Parents, Child, Health, Family

AUTONOMY AT THE TABLE - THE ROLE OF FOOD PARENTING PRACTICES IN CHILDREN'S FRUIT AND VEGETABLE CONSUMPTION: A SYSTEMATIC REVIEW AND META-ANALYSIS PROTOCOL

ABSTRACT

Introduction Despite parents' efforts, many children have nutrient-poor diets with insufficient fruit and vegetable consumption. Parents significantly influence children's eating habits at home through their food parenting practices. Although previous systematic reviews have explored food parenting practices, they were conducted some time ago. Therefore, it is timely to investigate the relationship between autonomy-supportive practices and fruit/vegetable consumption in children aged 2 to 12.

Methods and analysis The systematic review and meta-analysis protocol will conducted by PRISMA-P guidelines. The databases PubMed®, Scopus™, Web of Science™, PsycINFO®, EMBASE®, LILACS®, and Google Scholar® will be searched with no restrictions on publication year, country, or language. In addition to the databases, the search will be supplemented by manual searches of reference lists from the included articles. Studies that assess at least one parental autonomy-supportive food practice and its relationship with fruit and vegetable consumption in healthy children aged two to twelve years will be included. Results will be organized in tables and figures. A meta-analysis will be conducted if data availability permits. Risk of bias will be assessed using Joanna Briggs Institute tools. All steps will be conducted independently by two reviewers.

Ethics and dissemination Findings from this review will be important for understanding the influence of parental autonomy-supportive food practices on children's fruit and vegetable consumption, potentially informing health practices that promote healthy eating habits from childhood. No ethical approval is required for this review, and we plan to publish the findings in a peer-reviewed journal. This protocol is registered in PROSPERO (CRD42023442680).

Keywords: Feeding practice, Parenting, Children, Dietary intake, Fruits, Vegetables

STRENGTHS AND LIMITATIONS

⇒ The review will be conducted rigorously and transparently with a systematic review specialist.

⇒ A rigorous bias risk assessment will be incorporated using tools from the Joanna Briggs Institute.

⇒ The review will focus on identifying practices that may promote fruit and vegetable consumption.

⇒ Self-reported tools used in the included studies may introduce social desirability bias.

⇒ Studies conducted in Western populations may limit the generalization of results to other cultures.

1. INTRODUCTION

Despite parents' and families' efforts to provide adequate and healthy nutrition, many children still have nutrient-poor diets[1]. In 2019, according to the report The State of the World's Children[2], two out of five children did not consume fruits or vegetables, thus missing out on the essential nutritional benefits of these foods. At the same time, the consumption of processed snacks and beverages among young children is high, contributing to the early development of overweight and obesity[2].

Fruits and vegetables are nutrient-rich foods that provide vitamins, minerals, dietary fibers, and antioxidants. They should be introduced early in a child's diet and offered regularly[1]. The World Health Organization (WHO) recommends a daily intake of 400 grams (five servings) of fruits and vegetables to promote adequate health[3]. A diverse diet supports healthy growth and development throughout life and reduces the risk of non-communicable chronic diseases (NCDs), contributing to lower mortality rates from these conditions[3,4].

The home environment is fundamental to a child's physical, cognitive, social, and emotional development[5,6]. Particularly in the context of nutrition, parents significantly influence the formation of eating habits and preferences through their actions and behaviors. In the scientific literature, these behaviors are referred to as food parenting practices. Food parental practices encompass the behaviors and actions, whether intentional or not, that parents engage in within the realm of feeding their children, with the aim of shaping their attitudes, behaviors, and beliefs[7].

According to the model proposed by Vaughn et al. (2016)[7] and aligned with Self-Determination Theory (SDT)[8], food parenting practices are divided into three main categories: coercive control, structure, and autonomy support. Coercive control practices in the context of feeding include pressure to eat, food restriction, threats and bribes, and using rewards to influence children's behavior. The structure involves organizing the food environment, setting and communicating clear and consistent rules, meal setup, and family eating habits. The autonomy support involves nutritional education, child involvement in food acquisition and preparation, encouragement, praise, reasoning, and negotiation[7].

Studies have shown that structure and autonomy-support practices are associated with positive outcomes in children's health, while coercive control practices are linked to negative consequences. However, the study results were heterogeneous or sometimes did not reach statistical significance[7,9,10]. Three reviews published between 2016 and 2017 suggested that this inconsistency may be attributed to the fact that contextual variables (e.g., parenting style and family structure) and individual factors (e.g., temperament and eating behavior) are not uniformly controlled across studies or to the lack of clarity in the definitions used to describe parental practices[7,9,10].

Although some systematic reviews have investigated the relationship between food parenting practices and children's eating habits[9,10], these reviews were published some time ago and primarily focused on coercive control and structure practices. There has been growing interest in studying food parenting practices in recent years. In this regard, there remains a gap in the literature, particularly concerning the investigation of the relationship between autonomy-supportive feeding practices and children's eating habits. This systematic review and meta-analysis aims to fill this gap by examining and synthesizing the available evidence on the relationship between autonomy-supportive food parenting practices, as defined by the model proposed by Vaughn et al. (2016)[7], and fruit and vegetable consumption in children aged two to twelve years. Herein, we present the study protocol.

2. MATERIALS AND METHODS

2.1. Protocol and Registration

This review and meta-analysis protocol was developed following the guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses for Protocols 2015 (PRISMA-P 2015)[11,12] (Supplemental Table 1). To ensure transparency and reproducibility, and

to avoid duplicating efforts on the same research topic, the protocol was submitted and registered with the International Prospective Register of Systematic Reviews (PROSPERO) under registration number CRD42023442680. Any changes to this protocol during the study will be updated in the PROSPERO registry and described in the final manuscript.

2.2. Information Sources and Search Strategy

The Population, Intervention or Exposure, Comparison, Outcomes, and Study Design - PICOS acronym[13] (Table 1) was used to formulate the research question*: "Is there a relationship between autonomy-supportive parental feeding practices and fruit and vegetable consumption in children aged two to twelve years?"* This age range was chosen to align with the definition of children as outlined in Job et al[14]. Furthermore, studies examining food parenting practices among child caregivers often cover a broad age range, including early and middle childhood, which can make it challenging to distinguish clearly between age groups. This review will focus on children, as this is the period when the home environment strongly influences the formation of eating habits, shaping children's attitudes and perceptions of food.

Table 1 - PICOS Criteria for Study Inclusion

Parameter	Inclusion Criteria	Exclusion Criteria
Population	Caregivers or primary guardians of healthy children aged two to twelve years.	Caregivers of children with conditions that may affect feeding (e.g., celiac disease, food allergies, food intolerances, autism spectrum disorder, Down syndrome, diabetes).
Intervention or Exposure	Evaluated at least one parental autonomy-supportive feeding practice and used validated instruments or tools with verified internal consistency of items. Patterns or profiles that only included autonomy-supportive practices will be included in this review.	Studies that used statistical approaches to combine parental practices from multiple domains into a single variable, i.e., evaluating patterns/profiles of parental practices.
Comparison	Not applicable	Not applicable
Outcome	Evaluated fruit and/or vegetable consumption through dietary frequency questionnaires, food diaries, and/or direct food weighing, or assessed preferences for these foods.	Evaluated combined fruit and vegetable consumption within a single dependent variable category or assessed fruits and vegetables as separate measures. Studies that combined fruit and vegetable consumption with other types of foods.
Study Type	Observational studies (cross-sectional, cohort, case-control). Intervention studies (randomized clinical trials and experimental studies).	Studies with missing and/or unclear data, even after requesting information from authors, letters, reviews, conference abstracts, opinion pieces, case reports, poster presentations, news summaries, theses, and dissertations.

The following databases will be consulted to identify relevant studies: PubMed® (National Library of Medicine), Scopus™ (Elsevier), Web of Science™ Core Collection (Clarivate Analytics), PsycINFO® (American Psychological Association), EMBASE® (Elsevier), and LILACS® (BIREME). A limited search of the first 100 records will also be conducted in Google Scholar®. Searches in for PubMed® will cover all fields, while searches in the other databases will be performed on titles, abstracts, and keywords. Secondary searches will include reviewing the reference lists of included studies and relevant systematic reviews. Additionally, if information is lacking, the authors of the articles will be contacted.

Indexed terms and their synonyms were used to identify all relevant articles with boolean operators. The "OR" operator combined similar terms, broadening the scope of each search strategy. The blocks of terms were then combined using the "AND" operator. Searches were conducted in the databases without restrictions on year, country, or publication language. Following the recommendations of Greenhalgh and Peacock (2005)[15], systematic review team experts were consulted to refine the search strategy. Table 2 details the structure of the overall search strategy, including the descriptors and boolean operators used in the databases. Specific search strategies for each database can be found in Supplemental Table 2. All studies meeting this review's eligibility criteria (Table 1) will be included. The review will start in May 2023 and is expected to be completed in May 2025.

Table 2 - Keywords used in the search strategy grouped into blocks.

Block (PICO)	
# 1 P	(1) child OR children OR preschool OR "child, preschool" OR "children, preschool" OR "preschool child" OR "preschool children" OR "preschool-aged child" OR preschoolers
# 2 I	(2) parenting OR "child rearing" OR "food parenting" OR "parenting practices" OR "parental feeding practice" OR "parental feeding practices" OR "parenting feeding practices" OR "parent feeding practice" OR "parent feeding practices" OR "parents feeding practices" OR "maternal feeding practices" OR "food parenting practice" OR "food parenting practices" OR "parenting child-feeding practices" OR "parental child-feeding practices" OR "parental feeding behaviour" OR "parental feeding behaviours" OR "parental feeding behavior" OR "parental feeding behaviors" OR "feeding strategy" OR "feeding strategies" OR "parental feeding style" OR "parental feeding styles" OR "family feeding practices" OR "rearing child" OR "autonomy support" OR "autonomy promotion"
# 3 O	(3) eating OR "food preferences" OR fruit OR vegetables OR "food intake" OR "dietary intake" OR "dietary intakes" OR "eating habits" OR "food preference" OR "healthy food" OR "healthy eating" OR "healthy intake" OR "food consumption" OR fruits OR vegetable
Search Strategy	(#1) AND (#2) AND (#3)

Note: "P" stands for Population, "I" refers to Intervention or Exposure, and "O" represents Outcome.

2.3. Eligibility Criteria

The eligibility criteria are detailed in Table 1, with no restrictions on publication year, country, or language. All included articles will be checked for possible retractions. Eligible studies for the systematic review will be rigorously examined, including the use of Scite – an acronym for "Smart Citation Index," available online (https://scite.ai/) – to confirm the validity of the evidence and identify any retraction records. Scite is a research tool that offers an innovative way to verify, assess, and contextualize citations of scientific articles. Among its various features, Scite checks if a specific article has been retracted or contested, thus ensuring the integrity of the sources used[16].

2.4. Study Selection Process

The identified articles will be selected, and their metadata will be transferred to Zotero 6.0 (Corporation for Digital Scholarship, VA, Fairfax) in RIS format, where duplicates will be identified and removed. The metadata will then be imported into Rayyan® (available online at https://www.rayyan.ai/)[17], a software specifically designed for systematic reviews, with the reviewer blinding feature enabled for evaluation.

In Rayyan®, the initial screening and selection of studies will be conducted by reading titles and abstracts to check compliance with inclusion criteria. Two independent reviewers (ECL and PRV) will perform this screening. A third researcher (PRM) will resolve any discrepancies between reviewers. In the subsequent phase, the same two reviewers will read the full text of the remaining articles to confirm eligibility. Discrepancies between reviewers during this phase will also be resolved by the third reviewer (PRM). Finally, articles deemed eligible will be included in this systematic review. The flowchart of the study selection process for this review is illustrated in Figure 1, using a model recommended by PRISMA 2020.

Conducting the review with independent reviewers and blinding is crucial to minimize the likelihood of individual biases that may influence the review results. This increases the impartiality and objectivity of the analysis. Additionally, using independent and parallel reviewers allows for comparing assessments made by different reviewers. In this regard, reliability (Cohen's kappa coefficient, denoted as κ) and agreement (agreement ratio) between reviewers will be measured, increasing confidence in the results obtained, using R software version 4.3.3 (R Foundation, Vienna, Austria). The κ coefficient ranges from -1 to 1, reflecting different levels of agreement between reviewers. A value of $0 < \kappa \leq 0.20$ indicates no agreement; $0.21 < \kappa \leq 0.39$ indicates minimal agreement; $0.40 < \kappa \leq 0.59$ indicates weak agreement; $0.60 < \kappa \leq 0.79$ indicates moderate agreement; $0.80 < \kappa \leq 0.90$ indicates strong agreement; and ≥ 0.90 indicates almost perfect agreement[18].

2.5. Data Extraction, Synthesis, and Analysis

Data will be extracted, assessed, and synthesized independently and blindly by the same two reviewers (ECL and PRV). Any discrepancies will be resolved by the third reviewer (PRM), if necessary. An extraction spreadsheet has been developed with the support of experts from the team, and it includes information such as publication details (authors, year, country), study type, participant characteristics (age, sex, sample size), autonomy-supportive practices evaluated, instruments used, methods of dietary intake assessment, confounding variables, and key results (Supplemental Table 3).

In addition to the aforementioned descriptive synthesis, this review will consider performing a quantitative synthesis through meta-analysis if the quantitative data from our investigation allows for it. Regression coefficients and Pearson and Spearman correlation coefficients, as available in the included studies, will be used to estimate the association between parental feeding practices and children's fruit and vegetable consumption. The meta-analysis will calculate the weighted average of the regression and correlation coefficients to estimate the association's average effect, considering each study's sample weight.

Statistical methods will be applied to assess the heterogeneity among studies, using the I^2 statistic to quantify variability among study results and categorize heterogeneity as mild (25–50%), moderate (50–75%), or severe (>75%)[19]. The analysis will be conducted with a 95% confidence interval. Additionally, if two or more studies report results or information on the same data, the study with the largest number of participants will be considered.

To explore potential variations in the effects, subgroup analyses will be conducted, stratifying the studies by country of origin, children's age group, reporting perspective (whether reported by parents or children), method of parental feeding practice assessment, and dietary intake assessment[16]. Additionally, a sensitivity analysis will be performed to evaluate the robustness of the results, considering the influence of potential sources of bias and variability in the data. The results will be objectively categorized and, if necessary, subcategorized. These findings will be presented clearly and concisely through figures, diagrams, or other appropriate graphical elements to illustrate patterns, trends, and outcomes[20].

In addition to the aforementioned statistical analyses, a funnel plot will be used to assess publication bias among the included studies. This plot is useful for visualizing the distribution of studies according to effect size and precision. Asymmetry in the funnel plot may indicate publication bias, where studies with positive or significant results are more likely to be published compared to studies with negative or non-significant results[21]. All statistical analyses will be conducted in R Studio version 4.3.4 (RStudio, Boston, MA), using two-sided P-values.

2.6. Methodological Quality Assessment

The same two reviewers mentioned previously (ECL and PRV) will assess the risk of bias in eligible articles using the Joanna Briggs Institute tools according to the relevant study types (Joanna Briggs Institute, 2022, available at https://jbi.global/critical-appraisal-tools).[22] Each article will be evaluated using the corresponding checklist, with responses categorized as "Yes" if the criterion is met, "No" if not met, "Unclear" if the information is not clear in the article, and "NA" if not applicable. In case of disagreements, the third reviewer (PRM) will be consulted to resolve discrepancies. The risk of bias will be determined based on a recent systematic review that also used the Joanna Briggs Institute checklists[23]. The articles will be classified into three levels of risk of bias: high, when the proportion of "yes" responses was up to 65%; moderate, when the proportion was above 65% and less than 87.5%; and low, when it was equal to or greater than 87.5%[23].

2.7. Reviewer Training

Reviewers assessing study eligibility will undergo training on inclusion and exclusion criteria, with the training conducted by the author specializing in systematic review (G. M. A.).

They will also receive training on bias risk assessment tools and data extraction spreadsheets. Moreover, the training process covered how to correctly use the Rayyan software and standardize procedures too.

2.8. Ethics and Dissemination

Ethical approval is not required for this type of study. The results will be submitted for publication in a peer-reviewed journal.

3. DISCUSSION

Food plays a fundamental role in a child's life from the earliest moments[24]. In the intrauterine environment, the food environment already significantly influences the individual's development through early exposure to smells and flavors, which can impact the child's food preferences[25]. However, the influence of food goes beyond this. Ecological models recognize that multiple factors shape the development of eating habits and preferences[24]. These factors range from proximal contextual aspects, such as food parenting practices, to more distal influences, including external factors beyond the family environment, such as school, peers, and access to food outside the home[24].

It is important to highlight that these factors do not act in isolation but interact. In this sense, family demographic characteristics such as race, ethnicity, education level, income, and food security can influence the food practices parents adopt, which, in turn, impact children's food preferences and consumption[7]. This review not only aims to assess the relationship between food parenting practices, particularly autonomy-supportive ones, and children's fruit and vegetable consumption but also to explore what these factors have been addressed in existing studies.

Regarding food parenting practices, scientific literature has shown that non-responsive parenting practices negatively affect children's health[7]. These practices involve parents not adequately responding to their children's hunger and satiety cues[26]. Strategies such as pressuring children to eat, to clean their plates, or imposing food restrictions can lead to negative relationships with food, resulting in reduced acceptance of healthy foods, increased preference for restricted foods, and the potential development of disordered eating patterns[7]. Food restriction is associated with higher Body Mass Index (BMI), while pressure to eat is associated with lower BMI, particularly in cross-sectional studies[27].

On the other hand, responsive feeding practices, such as autonomy-supportive practices where parents appropriately and positively respond to children's hunger and satiety cues, have been associated with more favorable outcomes[7,26]. According to Vaughn et al. (2016)[7], these autonomy-supportive practices include various strategies that encourage children's self-determination. For example, involving children in meal preparation is one such practice, allowing them to learn about food and to develop cooking skills early. Encouraging the exploration of new foods, such as fruits and vegetables, and teaching nutrition according to the child's age helps increase their awareness about the importance of balanced eating. Additionally, praising children for making healthy food choices reinforces positive behaviors.

However, scientific literature shows some inconsistencies in results, which may be attributed to contextual (e.g., family structure and parenting style) and individual variations (e.g., temperament and eating behavior) that are not adequately controlled[7,10]. Moreover, some studies lack clarity in defining food parenting practices, which may contribute to these discrepancies. Standardizing these definitions would aid in comparing results across different studies and in formulating more effective strategies for promoting healthy eating habits among children[7].

4. STRENGTHS AND LIMITATIONS

This systematic review protocol has several strengths. First, the future review, conducted with rigor and transparency, is expected to identify gaps in the existing literature, encouraging further research to deepen the understanding of parental feeding practices and their impact on child health. By investigating the relationship between parental feeding practices and children's consumption, the review may promote healthy eating habits from an early age, with potential long-term effects on an individual's life. Additionally, the results may identify more effective food parenting practices for encouraging fruit and vegetable consumption, providing important evidence to guide healthcare professionals and child caregivers. The findings may support the development of programs and interventions that promote feeding practices that are more responsive to children's needs. The subgroup analysis is likely feasible, as it enhances the understanding of result consistency and the factors influencing the findings, such as contextual and methodological differences between studies. Finally, the review may be relevant for informing public policies and health programs to improve child health.

However, some limitations are expected. Firstly, the tools used to assess parental practices and food consumption are often self-reported, which increases the likelihood of social desirability bias. Secondly, most studies may be cross-sectional, preventing causal inferences between variables. Thirdly, heterogeneity in the definitions and methodologies of the included studies may complicate the comparison and synthesis of results. Fourthly, as observed in other reviews[9,10], most studies on parental feeding practices are limited to Western populations. Since culture can influence parent-child relationships, the findings may not be generalized to other cultures. Finally, as the aim of this review is to conduct a meta-analysis, subgroup analysis may provide important insights into contextual and methodological variations, allowing for a more robust interpretation of the findings.

5. CONCLUSION

The results of this review may encourage future research on the influence of autonomy-supportive food parenting practices on children's food consumption. Furthermore, understanding the factors influencing food consumption and preferences can help refine public policies and health interventions to promote healthy eating habits from childhood. Ultimately, the benefits of healthy eating can be more effectively expanded when there is active involvement from parents, caregivers, and health professionals.

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Contributorship Statement: ECL and PRV are mainly responsible for the protocol writing. GMA, MN and KAM are mainly responsible for the design and revision of the protocol. ECL and PRV will be mainly responsible for study selection. ECL and PRV will be mainly responsible for charting data. ECL, PRV and PRM will be responsible for reporting results. ECL, PRV and PRM will be responsible for the discussion. KAM is responsible for the guidance of the whole study and is the guarantor. All authors contributed to the article and approved the submitted version.

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Competing interests: The authors declare that no financial or personal interests could influence the results of this research.

Patient and Public Involvement: Patients or the public were not involved in the design, or conduct, or reporting, or dissemination plans of our research.

Patient consent for publication: This manuscript does not contain personal or medical information about any identifiable individual.

Ethics approval: This study does not require ethical committee approval as it involves a review of existing literature and does not include primary data collection involving human subjects.

Data availability statement: All data relevant to the study are included in the article or uploaded as supplementary information.

AI Technology Used: The AI technologies used were ChatGPT® and Grammarly®.

Reason for Use: These AI tools were employed to detect writing errors, cohesion issues, and grammar problems, aiming to improve the text's clarity and flow.

How the AI Technology Was Used: The AI tools were used to review the manuscript, identifying grammatical errors and issues of cohesion. The goal was to ensure that the text was clear and cohesive.

AI Input and Output:

- Input: The manuscript text was provided as input to the AI tools.
- Output: The tools provided suggestions for grammatical corrections, cohesion adjustments, and improvements to sentence structure, which were reviewed by the authors.

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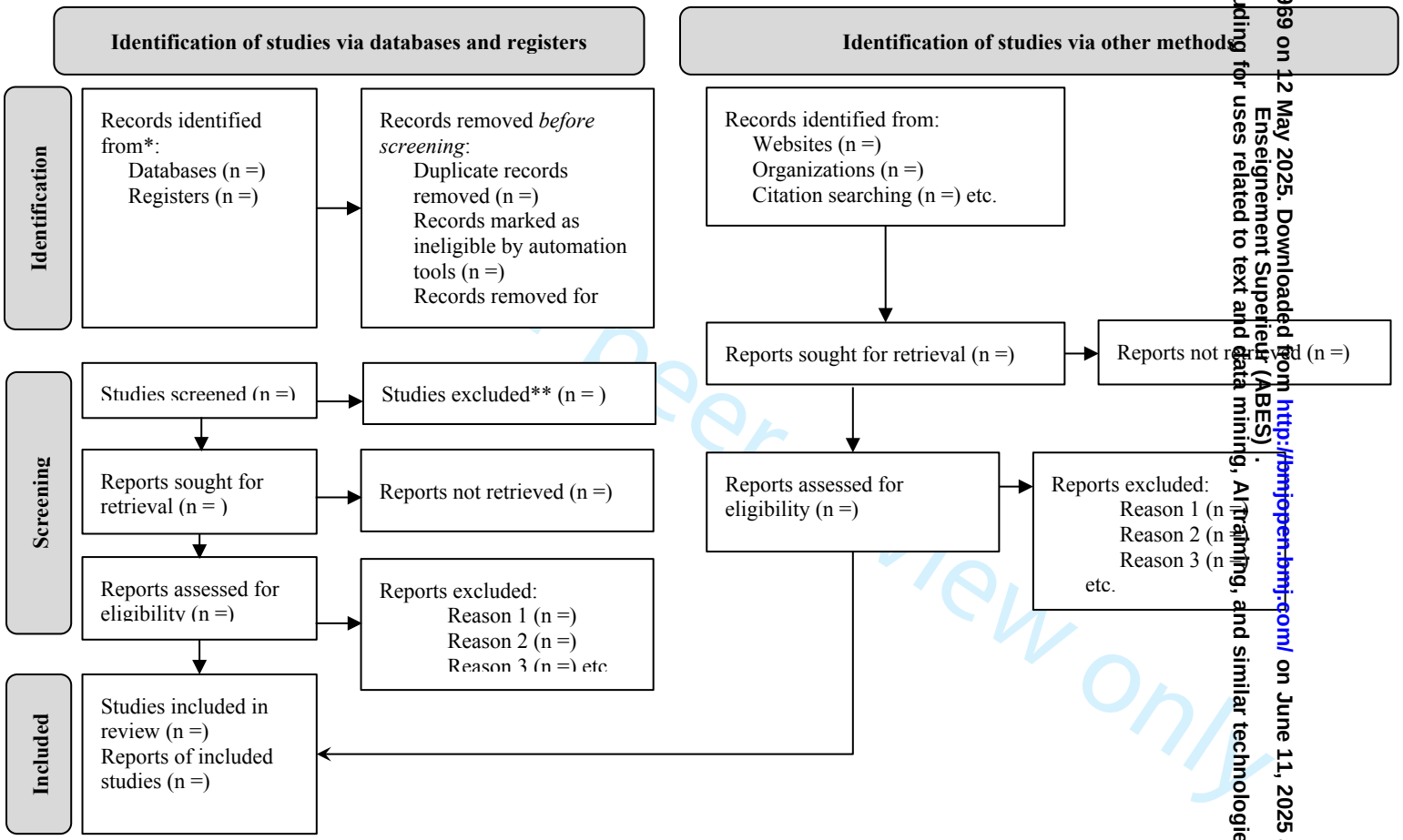
Figure 1 - PRISMA 2020 flow diagram for the identification, screening, and inclusion of studies in the review.

*Consider, if feasible to do so, reporting the number of records identified from each database or register searched (rather than the total number across all databases/registers).
**If automation tools were used, indicate how many records were excluded by a human and how many were excluded by automation tools.
Source: Page MJ, et al. BMJ 2021;372:n71. doi: 10.1136/bmj.n71.



*Consider, if feasible to do so, reporting the number of records identified from each database or register searched (rather than the total number across all databases/registers).
**If automation tools were used, indicate how many records were excluded by a human and how many were excluded by automation tools.
Source: Page MJ, et al. BMJ 2021;372:n71. doi: 10.1136/bmj.n71.

Figure 1 - PRISMA 2020 flow diagram for the identification, screening, and inclusion of studies in the review.

SUPPLEMENTAL TABLE 1

PRISMA-P (Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols) 2015 checklist: recommended items to address in a systematic review protocol*

Section and topic	Item No	Checklist item	Information reported		Page
ADMINISTRATIVE INFORMATION			**Yes**	**No**	
Title:					
Identification	1a	Identify the report as a protocol of a systematic review	✓		1
Update	1b	If the protocol is for an update of a previous systematic review, identify as such		✓	N/A
Registration	2	If registered, provide the name of the registry (such as PROSPERO) and registration number	✓		3
Authors:					
Contact	3a	Provide name, institutional affiliation, e-mail address of all protocol authors; provide physical mailing address of corresponding author	✓		1
Contributions	3b	Describe contributions of protocol authors and identify the guarantor of the review	✓		1
Amendments	4	If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments		✓	N/A
Support:					
Sources	5a	Indicate sources of financial or other support for the review		✓	
Sponsor	5b	Provide name for the review funder and/or sponsor		✓	
Role of sponsor or funder	5c	Describe roles of funder(s), sponsor(s), and/or institution(s), if any, in developing the protocol		✓	
INTRODUCTION					

Rationale	6	Describe the rationale for the review in the context of what is already known		✓	1,2,3
Objectives	7	Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO)		✓	3
METHODS					
Eligibility criteria	8	Specify the study characteristics (such as PICO, study design, setting, time frame) and report characteristics (such as years considered, language, publication status) to be used as criteria for eligibility for the review	✓		Tabela 1, pág 6
Information sources	9	Describe all intended information sources (such as electronic databases, contact with study authors, trial registers or other grey literature sources) with planned dates of coverage	✓		6
Search strategy	10	Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be repeated	✓		Pág 4, tabela 2
Study records:					
Data management	11a	Describe the mechanism(s) that will be used to manage records and data throughout the review	✓		6,7
Selection process	11b	State the process that will be used for selecting studies (such as two independent reviewers) through each phase of the review (that is, screening, eligibility and inclusion in meta-analysis)	✓		6,7
Data collection process	11c	Describe planned method of extracting data from reports (such as piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators	✓		6,7
Data items	12	List and define all variables for which data will be sought (such as PICO items, funding sources), any pre-planned data assumptions and simplifications	✓		6,7

Outcomes and prioritization	13	List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale	✓		Table 1
Risk of bias in individual studies	14	Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis	✓		8
Data synthesis	15a	Describe criteria under which study data will be quantitatively synthesised			
	15b	If data are appropriate for quantitative synthesis, describe planned summary measures, methods of handling data and methods of combining data from studies, including any planned exploration of consistency (such as I^2, Kendall's τ)	✓		8
	15c	Describe any proposed additional analyses (such as sensitivity or subgroup analyses, meta-regression)			
	15d	If quantitative synthesis is not appropriate, describe the type of summary planned			
Meta-bias(es)	16	Specify any planned assessment of meta-bias(es) (such as publication bias across studies, selective reporting within studies)		✓	N/A
Confidence in cumulative evidence	17	Describe how the strength of the body of evidence will be assessed (such as GRADE)		✓	8

*** It is strongly recommended that this checklist be read in conjunction with the PRISMA-P Explanation and Elaboration (cite when available) for important clarification on the items. Amendments to a review protocol should be tracked and dated. The copyright for PRISMA-P (including checklist) is held by the PRISMA-P Group and is distributed under a Creative Commons Attribution Licence 4.0.**

From: Shamseer L, Moher D, Clarke M, Ghersi D, Liberati A, Petticrew M, Shekelle P, Stewart L, PRISMA-P Group. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: elaboration and explanation. BMJ. 2015 Jan 2;349(jan02 1):g7647.

SUPPLEMENTAL TABLE 2

Database	Date	Search Strategy	Results
Pubmed	**24/06/2024**	Searches All Fields (("child" [Mesh] OR children OR preschool OR "child, preschool" [Mesh] OR "children, preschool" OR "preschool child" OR "preschool children" OR "preschool-aged child") AND ("Parenting" [Mesh] OR "Child Rearing" [Mesh] OR "food parenting" OR "parenting practices" OR "parental feeding practice" OR "parental feeding practices" OR "parenting feeding practice" OR "parent feeding practice" OR "parent feeding practices" OR "parental feeding practices" OR "maternal feeding practices" OR "food parenting practice" OR "food parenting practices" OR "parenting child-feeding practices" OR "parental child-feeding practices" OR "parental feeding behaviour" OR "parental feeding behaviours" OR "parental feeding behavior" OR "parental feeding behaviors" OR "feeding strategy" OR "feeding strategies" OR "parental feeding style" OR "parental feeding styles" OR "family feeding practices" OR "rearing child" OR "autonomy support" OR "autonomy promotion") AND ("eating" OR "food preferences" OR "fruit" OR "vegetables" OR "food intake" OR "dietary intake" OR "dietary intakes" OR "eating habits" OR "food preference" OR "healthy food" OR "healthy eating" OR "healthy intake" OR "food consumption" OR fruits OR vegetable))	**1816**
Scopus	**24/06/2024**	Searches TITLE-ABS-KEY ((children OR preschool OR "children, preschool" OR "preschool children" OR "preschool-aged child" OR preschoolers) AND ("Parenting" OR "Child Rearing" OR "food parenting" OR "parenting practices" OR "parental feeding practices" OR "parenting feeding practices" OR "parents feeding	**2946**

		practices" OR "maternal feeding practices" OR "food parenting practices" OR "parenting child-feeding practices" OR "parental child-feeding practices" OR "parental feeding behaviours" OR "feeding strategies" OR "parental feeding styles" OR "family feeding practices" OR "rearing child" OR "autonomy support" OR "autonomy promotion") AND ("eating" OR "food preferences" OR "fruit" OR "vegetables" OR "food intake" OR "dietary intakes" OR "eating habits" OR "food preference" OR "healthy food" OR "healthy eating" OR "healthy intake" OR "food consumption" OR fruits OR vegetable))	
Web of Science	**24/06/2024**	Searches title, abstract, keyword plus, and author keywords. (children OR preschool OR "child, preschool" OR "children, preschool" OR "preschool child" OR "preschool children" OR "preschool-aged child" OR preschoolers) AND ("Parenting" OR "Child Rearing" OR "food parenting" OR "parenting practices" OR "parental feeding practice" OR "parental feeding practices" OR "parenting feeding practices" OR "parent feeding practice" OR "parent feeding practices" OR "parents feeding practices" OR "maternal feeding practices" OR "food parenting practice" OR "food parenting practices" OR "parenting child-feeding practices" OR "parental child-feeding practices" OR "parental feeding behaviour" OR "parental feeding behaviours" OR "parental feeding behavior" OR "parental feeding behaviors" OR "feeding strategy" OR "feeding strategies" OR "parental feeding style" OR "parental feeding styles" OR "family feeding practices" OR "rearing child" OR "autonomy support" OR "autonomy promotion") AND ("eating" OR "food preferences" OR "fruit" OR "vegetables" OR "food intake" OR "dietary intake" OR "dietary intakes" OR "eating habits" OR "food preference" OR "healthy food" OR "healthy eating" OR "healthy intake" OR "food consumption" OR fruits OR vegetable)	**2063**

PsycoINFO	**24/06/2024**	Searches abstract ("child" OR children OR "children preschool" OR "Child, Preschool" OR "children preschool" OR "preschool child" OR "preschool children" OR "preschool-aged child" OR preschoolers) AND ("Parenting" OR "Child Rearing" OR "food parenting" OR "parenting practices" OR "parental feeding practice" OR "parental feeding practices" OR "parenting feeding practices" OR "parent feeding practice" OR "parent feeding practices" OR "parents feeding practices" OR "maternal feeding practices" OR "food parenting practice" OR "food parenting practices" OR "parenting child-feeding practices" OR "parental child-feeding practices" OR "parental feeding behaviour" OR "parental feeding behaviours" OR "parental feeding behavior" OR "parental feeding behaviors" OR "feeding strategy" OR "feeding strategies" OR "parental feeding style" OR "parental feeding styles" OR "family feeding practices" OR "rearing child" OR "autonomy support" OR "autonomy promotion") AND ("eating" OR "food preferences" OR "fruit" OR "vegetables" OR "food intake" OR "dietary intake" OR "dietary intakes" OR "eating habits" OR "food preference" OR "healthy food" OR "healthy eating" OR "healthy intake" OR "food consumption" OR fruits OR vegetable)	**925**
Embase	**24/06/2024**	Searches Title, Abstract or Author Keywords ("child" OR children OR "children preschool" OR "Child, Preschool" OR "children preschool" OR "preschool child" OR "preschool children" OR "preschool-aged child" OR preschoolers) AND ("Parenting" OR "Child Rearing" OR "food parenting" OR "parenting practices" OR "parental feeding practice" OR "parental feeding practices" OR "parenting feeding practices" OR "parent feeding practice" OR "parent feeding practices" OR "parents feeding practices" OR "maternal feeding practices" OR "food	**1824**

		parenting practice" OR "food parenting practices" OR "parenting child-feeding practices" OR "parental child-feeding practices" OR "parental feeding behaviour" OR "parental feeding behaviours" OR "parental feeding behavior" OR "parental feeding behaviors" OR "feeding strategy" OR "feeding strategies" OR "parental feeding style" OR "parental feeding styles" OR "family feeding practices" OR "rearing child" OR "autonomy support" OR "autonomy promotion") AND ("eating" OR "food preferences" OR "fruit" OR "vegetables" OR "food intake" OR "dietary intake" OR "dietary intakes" OR "eating habits" OR "food preference" OR "healthy food" OR "healthy eating" OR "healthy intake" OR "food consumption" OR fruits OR vegetable)	
Lilacs	**24/06/2024**	Searches Título, Reumo e Assunto ((criança) OR (crianças) OR (child) OR (pré-escolar) OR (pré-escolares) OR (“criança pré-escolar”) OR (“crianças pré-escolares”) OR (“child, preschool”) AND (“poder familiar”) OR (parenting) OR (parentalidade) OR (“práticas alimentares parentais”) OR (“práticas parentais”) OR (“práticas educativas alimentares”) OR (“práticas de parentalidade alimentar”) OR (“práticas de alimentação parental”) OR (“food parenting”) OR (“parenting practices”) OR (“parental feeding practice”) OR (“parental feeding practices”) OR (“food parenting practice”) OR (“food parenting practices”) OR (“autonomy support”) OR (“autonomy promotion”) OR (“parenting feeding practices”) OR (“parent feeding practice”) OR (“parent feeding practices”) OR (“parents feeding practices”) OR (“maternal feeding practices”) OR (“parenting child-feeding practices”) OR (“parental child-feeding practices”) OR (“parental feeding behavior”) OR (“parental feeding behaviors”) OR (“feeding strategy”) OR (“feeding strategies”) OR (“parental feeding style”) OR (“parental feeding styles”) OR (“family feeding practices”) OR (“child	**531**

		rearing") AND (frutas) OR (fruit) OR (fruits) OR (verduras) OR (hortaliças) OR (hortaliças) OR (vegetable)	

SUPPLEMENTAL TABLE 3

Author, Year, Country	Study Design and Duration	Sample (Total Number (N), Age and Gender of Children and Caregivers)	Instrument Used to Assess Parental Feeding Practices	Assessed Autonomy Practices	Fruit and Vegetable Consumption Assessment (Method, Duration)	Confounding Variables	Main Results	Risk of Bias