e-ISSN : 2597-6052

MPPKI MEDIA PUBLIKASI PROMOSI KESEHATAN INDONESIA

Research Articles Open Access

The Role of Family Eating and Activity Habits in the Relationship Between Parenting and Feeding Practices on Child Eating Behavior

Nadirawati Nadirawati[1*], Chatarina Suryaningsih[2], Felina C. Young[3], Hartiah Haroen[4], Susilowati Susilowati[5]
[1]Department of Community Nursing, Nursing Study Program, Jenderal Achmad Yani University, Cimahi, Indonesia
[2]Pediatric Nursing Department, Nursing Study Program, Jenderal Achmad Yani University, Cimahi, Indonesia
[3]Nursing Management Department, School of Nursing, Philippine Women's University, Manila, Philippines
[4]Department of Community Nursing, Faculty of Nursing, Universitas Padjajaran, West Java, Indonesia
[5]Department of Nutrition, Public Health Study Program, Jenderal Achmad Yani University, Cimahi, Indonesia

***Correspondence Author:** E-mail: nadirawati@lecture.unjani.ac.id

ARTICLE INFO

Manuscript Received: 25 Apr, 2025
Revised: 13 Aug, 2025
Accepted: 14 Aug, 2025
Date of Publication: 11 Sept, 2025
Volume: 8
Issue: 9
DOI: 10.56338/mppki.v8i9.7900

KEYWORDS

Malnutrition;
Stunting;
Parenting Style;
Feeding Practices;
Family Eating Habits;
Child Eating Behavior

ABSTRACT

Introduction: Nutritional problems in children, including underweight and stunting, remain a global health challenge, particularly in Indonesia. This study examines the influence of parenting styles and feeding practices on children's eating behavior, with family eating and activity habits as a mediating variable

Methods: A cross-sectional survey design was employed in this study, involving 225 mothers of stunted and underweight children aged 2–5 years in Cimahi City, Indonesia. The study investigated key variables including parenting styles, feeding practices, family eating and activity habits, and children's eating behavior. Data were gathered using validated questionnaires and analyzed using Structural Equation Modeling (SEM) with the Partial Least Squares (PLS) approach. This analytical technique enabled the examination of complex causal relationships and latent constructs, including mediation pathways. The research complied with ethical standards and received approval from the Health Research Ethics Committee of the Faculty of Health Science and Technology, Jenderal Achmad Yani University, Cimahi, on May 31, 2024 (Certificate No. 086/KEPK/FITKes-Unjani/2024).

Results: The results showed that parenting styles ($\beta = 0.222$, $t = 3.630$, $p < 0.001$) and feeding practices ($\beta = 0.243$, $t = 3.640$, $p < 0.001$) significantly influenced children's eating behavior. Family eating and activity habits significantly mediated the relationship ($\beta = 0.448$, $t = 6.401$, $p < 0.001$). Feeding practices and parenting styles also predicted family habits ($f^2 = 0.369$ and 0.462, respectively).

Conclusion: These findings highlight the importance of family eating habits in shaping children's eating behavior and addressing malnutrition and stunting. Thus, family-based interventions are needed to improve healthy feeding practices and promote positive eating behavior in children at risk of malnutrition in Indonesia, aiming to achieve zero stunting and malnutrition.

Publisher: Fakultas Kesehatan Masyarakat Universitas Muhammadiyah Palu

INTRODUCTION

Malnutrition and stunting in children remain a significant global and national health challenge, particularly in developing countries. In 2020, approximately 149 million children under the age of five suffered from chronic malnutrition, resulting in stunted growth (1). In Indonesia, the prevalence of undernutrition increased from 17% to 17.1%, while stunting among children reached 21.6% in 2022(2)(3). The prevalence of stunting even exceeds the WHO threshold of 14% (4). Increased stunting prevalence has also been observed in Cimahi City, West Java, where the stunting rate rose by 6% in 2024, reaching 24.3%, up from 19% in 2022. This trend highlights significant challenges in urban areas, where rapid urbanization and socioeconomic disparities exacerbate malnutrition and stunting. This situation is particularly concerning, as studies have shown that high rates of malnutrition, including stunting, are driven by factors such as limited access to healthcare services, parenting styles, feeding practices, and restricted educational opportunities for parents(5)(6).

The Government of Indonesia has acknowledged the critical nature of malnutrition and stunting and has established ambitious objectives to address these challenges. Through the National Strategy for Accelerating Stunting Prevention (Stranas Stunting), the government aims to reduce the prevalence of stunting to 14% by 2024 (7). This initiative aligns with the Sustainable Development Goals (SDGs), particularly Goal 2, which seeks to end hunger and ensure the family has access to sufficient and nutritious food year-round (8)(6). It is crucial to understand the local context to achieve this target, including parenting styles, feeding practices, family eating habits, and family customs that significantly influence children's dietary behaviours. In many Indonesian households, traditional meals typically consist of rice and vegetables; however, there is an increasing trend towards consuming processed foods, which may contribute to poor nutritional outcomes and adversely affect children's health and development. Addressing these factors is essential for improving nutritional status and mitigating the risks of malnutrition and stunting (9).

Undernutrition and stunting have widespread effects, impacting physical growth and cognitive and social development, potentially compromising children's future quality of life(10). Moreover, the repercussions of undernutrition extend beyond immediate health concerns, influencing educational outcomes and economic productivity in communities. Children who suffer from stunting are more likely to experience difficulties in learning and lower academic achievement, which can perpetuate cycles of poverty and hinder national development efforts (11).

The main contributors to malnutrition and stunting in children are inadequate feeding practices, including the provision of unhealthy foods (2), which are closely linked to socioeconomic factors, nutritional knowledge and parenting styles (12). Parents play a crucial role in shaping children's food preferences and eating behaviours through their feeding practices. Parenting styles also significantly influence the family's eating environment, affecting children's overall food intake and eating habits (6)(10). Parenting styles refer to the strategies and approaches parents use to raise their children, which can significantly influence children's development (13). An authoritative parenting style, which combines emotional support with structured rules, tends to promote healthier eating behaviours. In contrast, authoritarian and permissive styles, such as picky eating, may lead to unhealthy eating patterns. Parental feeding practices, including meal frequency, types of food provided, and the mealtime environment, are also critical in shaping children's eating habits, preventing energy imbalances, and promoting healthier growth (14).

Zohar, Lev-Ari, and Bachner-Melman (15); Titaley et al. (16); Elisaria et al. (17) have examined the relationship between parenting styles, feeding practices, and children's eating behaviours, most existing research has focused on the individual influence of either parenting styles or feeding practices separately, without integrating both variables into a single structural model that considers the important role of family eating habits and activities as a mediating factor. Family eating habits and activities refer to the routines, behaviours, and practices related to food and meals within the family environment (18). These include the types of food consumed, meal frequency, and the social context of mealtime, for instance, eating together as a family (19). These habits play a critical role in shaping children's dietary patterns. In this study, family eating habits and activities serve as mediating variables, potentially influencing the relationship between parenting styles, feeding practices, and children's eating behaviours. Understanding these dynamics can provide insights into how family environments contribute to addressing issues like malnutrition and stunting in children.

Stunting and undernutrition remain significant issues in Indonesia. Therefore, it is crucial to further examine the effects of the interaction between parenting styles, feeding practices, and family eating habits and activities as mediating variables on children's eating behaviours within the framework of a structural equation model. This analysis is expected to provide a more comprehensive and valid understanding of the relationships between these interacting variables, offering new insights for more effective interventions in addressing nutritional problems in children in Indonesia.

The implications of this research are substantial, as it endeavours to enlighten policymakers and practitioners regarding efficacious strategies for fostering nutritious eating behaviours among children. By elucidating the mediating influences of familial dietary practices on children's nutrition, the investigation holds the potential to facilitate the formulation of culturally attuned interventions that tackle the fundamental determinants of malnutrition, thereby bolstering Indonesia's dedication to fulfilling the Sustainable Development Goals by the year 2030 (20). Ultimately, this research aspires to augment the comprehension of how synergistic approaches can engender significant advancements in child nutrition, particularly in areas with elevated incidences of stunting and underweight.

METHOD

This study employs a clear and systematic approach to ensure the reliability and validity of the findings. Below are the components of the methodology:

Research Type

This study employs a quantitative approach using Partial Least Squares Structural Equation Modeling (PLS-SEM) to examine the relationships among key variables. Parenting styles and feeding practices serve as independent variables, while children's eating behavior is the dependent variable. Family eating and activity habits are positioned as mediating variables. The conceptual framework is presented in Figure 1 below:

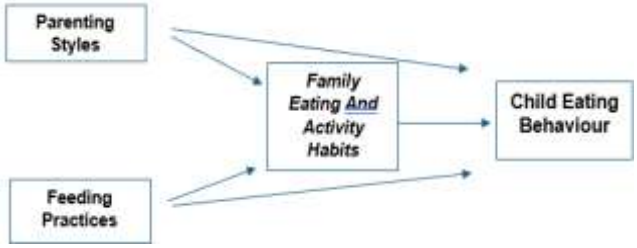

Figure 1. Research Model

In this study, the researcher utilized the following variables: independent variables, specifically Parenting Style (X1) and Feeding practices (X2); a dependent variable, Child Eating Behavior (Y); and a mediating variable, Family Eating and Activity Habits (Z).

Population and Sample

This study was conducted at the Citereup Health Center, located in Cimahi City, West Java Province, Indonesia. This health center has the highest rate of stunting and underweight in Cimahi City. As of August 2022, there were 2,314 children under five living in the Citereup Health Center's service area, with 23.77% experiencing stunting and undernutrition. A total of 225 participants were selected as the sample, following Hair's recommendations for structural equation modeling (SEM), which suggests a minimum sample size of 200. This study employed purposive sampling, conducted between June and August 2024, based on specific inclusion criteria relevant to the research objectives. The sample targeted mothers of stunted or underweight children aged 2 to 5 years, as this developmental stage is critical for establishing eating behavior patterns. Mothers with children younger than 2 or older than 5 were excluded to ensure the relevance and homogeneity of the sample. Purposive sampling was chosen to allow for focused selection of participants with characteristics most pertinent to the study variables, which would not have been adequately captured through probabilistic methods.

Research Location

This study was conducted in Cimahi City, West Java, Indonesia, a densely populated urban area with diverse socio-economic backgrounds. The research took place at Citereup community health centers (Puskesmas) that serve as primary care facilities for maternal and child health services. These centers were selected based on the prevalence of undernutrition and stunting among children aged 2–5 years, as identified in recent local health reports.

Instrumentation or Tools

Primary data were collected through questionnaires distributed to respondents, utilizing five instruments: the Demographic Profile Questionnaire for Mothers, developed specifically to gather contextual data such as education, number of children, employment status, income, and breastfeeding practices. Four of these questionnaires, the Parent Feeding Practices Questionnaire (PFPQ), Parenting Style Questionnaire, Family Eating and Activity Habits Questionnaire and Children's Eating Behavior Questionnaire (CEBQ), were translated from English into Indonesian using the method of translation and back-translation (21). This method ensured both linguistic accuracy and cultural relevance, preserving the validity of the instruments within the Indonesian context. The researcher requested a certified translator to translate the text from English to Indonesian. Subsequently, three bilingual experts with expertise in nutrition, community health, and paediatrics reviewed the consistency of the English and Indonesian versions of the questionnaire. All instruments utilized a Likert scale ranging from 1 (never) to 5 (always), with higher scores indicating stronger adherence to parenting style, feeding Practices, family eating and activity habits. The adaptation processes ensured psychometric integrity through pre-testing with 35 eligible mothers, confirming validity (ranging from 0.587 to 0.877) and reliability (Cronbach's Alpha coefficients between 0.706 and 0.961), demonstrating sufficient reliability for the Indonesian context.

Data Collection Procedures

The researcher designed a survey in the form of a questionnaire distributed to respondents based on specific criteria, namely, mothers with stunted and underweight children. The researcher employed electronic forms (Google Forms) and printed questionnaires to reach a wider audience and maximize response rates. Using Google Forms also allowed the researcher to reach a sample that could not attend the Community Health Activities (posyandu), providing flexibility in data collection. This combination of methods accommodates participants with varying access to technology, ensuring inclusivity and diversity within the sample. Therefore, this approach supports collecting data more representative of the broader population. The research team consisted of 12 students who collaborated with local health cadres from each posyandu in Cimahi, which had the highest rates of stunting and malnutrition. Each enumerator was accompanied by two cadres and assigned to a designated posyandu. Questionnaires were primarily distributed during scheduled posyandu sessions, as these gatherings provided access to a concentrated group of eligible participants. To address potential sample bias resulting from non-random attendance at posyandu, data collection was supplemented with outreach efforts. When the target sample size could not be achieved through posyandu attendance alone, trained students and local health cadres conducted home visits to reach mothers who did not regularly attend. This strategy helped diversify participation and enhance the representativeness of the sample. Respondents were assembled at posyandu centers, where informed consent was obtained prior to the survey. The researcher explained the study's purpose and provided clear instructions for completing the questionnaire. Participants were given approximately 30 minutes to complete the forms. Modest incentives were offered to encourage participation and acknowledge the respondents' time. Upon completion, the questionnaires were collected and subsequently entered into a digital database. All responses were compiled in Excel format for further analysis.

Data Analysis

All survey data were analyzed using IBM SPSS 26 for frequency analysis and percentage distribution to address research questions regarding demographic profiles (education, number of children, employment status, income, and exclusive breastfeeding practices). Path analysis was applied to examine the effects of independent variables and mediators on the dependent variable. Partial Least Squares Structural Equation Modeling (PLS-SEM) was employed using SmartPLS version 4.0.9.5 (licensed to StatSoft_LCC) to assess the relationships and effect strengths among the study variables. This approach enabled the evaluation of how parenting style, feeding practices,

and family eating and activity habits influenced children's eating behavior in Cimahi, Indonesia. The modeling process followed established PLS-SEM procedures, including: (1) developing the theoretical model; (2) constructing path diagrams and structural equations; (3) assessing the measurement (outer) model through convergent validity, discriminant validity, and reliability tests; (4) evaluating the structural (inner) model using coefficient of determination (R^2), predictive relevance (Q^2), effect size (f^2), and multicollinearity via Variance Inflation Factor (VIF); and (5) testing hypotheses using a bootstrapping procedure with 5,000 resamples to assess the significance of path coefficients, based on t-statistics and confidence intervals; and (6) summarizing findings and drawing conclusions (21)**.**

Ethical Approval

The study adhered to ethical standards and received approval from the Ethics Review Board at the Health Research Ethics Committee (KEPK) Faculty of Health Science and Technology of Jenderal Achmad Yani University of Cimahi on May 31, 2024, under ethical clearance certificate number 086/KEPK/FITKes-Unjani/2024. Participants were informed about the voluntary nature of their participation and were required to provide informed consent before data collection. Data collected through Google Forms and printed questionnaires were stored securely, with access restricted to authorized research personnel only. Furthermore, all identifying information was anonymized, and responses were coded to protect participants' confidentiality.

RESULTS

Demographic Profile of Mothers

This study included 225 mothers of stunted and underweight children aged 2-5 years, recorded in Cimahi City between June and August 2024. Table 1 shows that most respondents had a high school level education (57.8%), had two children (42.7%), were employed (83.1%), and earned above the minimum wage (69.3%). Additionally, most respondents provided exclusive breastfeeding to their children (67.6%).

Table 1. Demographic Profile of Participants (June-August 2024, n=225)

Characteristic	Frequency(n)	Percentage (%)
Education		
Primary School	14	6.2
Junior School	33	14
Senior School	130	57.8
Diploma	38	16.9
University	10	4.4
Number of children		
One Child	46	20.4
Two Children	96	42,7
Three Children	59	26.2
More than Three children	24	10.7
Employability		
Not Working	38	16.9
Working	187	83.1
Family Income		
Less Than Indonesian Minimum Wage (IDR 4.000.000)	69	30.7
More than Indonesian Minimum Wage (IDR 4.000.000)	156	69.3
Breastfeding		
Not exclusive Breastfeeding	73	32
exclusive Breastfeeding	152	67

Model Testing

Collinearity assessment (VIF)

Collinearity assessment is an essential step in evaluating whether predictor variables in a model are highly correlated, which can affect the stability and interpretation of regression coefficients. In this study, collinearity among the independent variables (parenting styles, feeding practices, and family eating and activity habits) was assessed using the variance inflation factor (VIF) (22). Table 2 shows that the VIF values for each construct variable are less than 5.0 (<5.0), indicating that none of the variables exhibit multicollinearity.

Table 2. Collinearity Assessment (VIF)

Latent variables	Child Eating Behaviour	Eating Habits and Family Activities
Feeding Practices	1.369	1.001
Parenting Styles	1.463	1.001
Eating Habits and Family Activities	1.850	

Coefficient of determination (R^2)

The coefficient of determination (R^2) measures the proportion of variance in the dependent variable that can be explained by the independent variables in the model. It provides an indication of the model's predictive power. An R^2 value closer to 1 suggests a strong explanatory power, while a value closer to 0 indicates weaker explanatory power. Based on Table 3, feeding Practices, parenting styles, and family eating habits and activities influence children's eating behavior by 51.2% (indicating a high predictive accuracy), while the remaining 48.8% is influenced by factors outside the research model. Similarly, the predictive accuracy for family eating habits and activities has a value of 0.460. This indicates that feeding practices and parenting styles influence family eating habits and activities by 46.0%, while the remaining 54.0% is influenced by other factors outside the research model.

Table 3. Coefficient of Determination (R^2)

Latent variables	R-square	R-square adjusted
Child Eating Behaviour	0.512	0.505
Eating Habits and Family Activities	0.460	0.455

Effect Size (f^2)

Effect size measures the magnitude of the relationship between variables and helps to determine the practical significance of the results. Table 4 shows that feeding practices exert a statistically large effect on family eating and activity habits ($f^2 = 0.369$), but only a small influence on Child Eating Behavior ($f^2 = 0.088$). Similarly, Parenting Styles also have a large influence on Family Eating Habits and Activities ($f^2 = 0.462$), yet their influence on Child Eating Behavior remains small ($f^2 = 0.069$). In contrast, Family Eating Habits and Activities have a medium effect on Child Eating Behavior, indicating that family eating habits and activities play a significant role in shaping children's eating behaviors ($f^2 = 0.222$).

Table 4. Effect Size **(f^2)**

Latent Variable	f-square	Description
Feeding Practices -> Child Eating Behaviour	0.088	Small
Feeding Practices -> Family Eating Habits and Activities	0.369	Large
Parenting Practices -> Child Eating Behaviour	0.069	Small
Parenting Styles -> Family Eating Habits and Activities	0.462	Large
Family Eating Habits and Activities -> Child Eating Behaviour	0.222	Medium

Hypothesis Testing

Estimated significance is evaluated to determine the validity of the proposed hypotheses and whether they can be confirmed or rejected. This assessment involves examining the t-statistic, which should exceed 1.96, and the probability value (p-value), which should be less than 0.05, indicating a maximum error rate of 5%. Table 5 shows

that all the variables tested significantly influence children's eating behavior. Parenting styles and feeding Practices directly affect children's eating behavior, with β coefficients of 0.222 and 0.243, respectively. However, family eating habits and activities have the largest impact (β = 0.448), highlighting the crucial role of the family environment in shaping children's eating behavior. Parenting styles and feeding Practices also indirectly influence children's eating behavior through family eating habits and activities. The results of this test indicate that family eating habits and activities mediate children's eating behavior (β = 0.448, t = 6.401).

Table 5. The Hypothesis of The Research Model Testing Result

	Hypothesis	β	t-value	p-values	Result
H1	Parenting Styles -> Child Eating Behaviour	0.222	3.630	0.000	Accepted
H2	Feeding Practices -> Child Eating Behaviour	0.243	3.640	0.000	Accepted
H3	Family Eating Habits and Activities -> Child Eating Behaviour	0.448	6.401	0.000	Accepted
H4	Parenting Styles -> Family Eating Habits and Activities -> Child Eating Behaviour	0.224	5.020	0.000	Accepted
H5	Feeding Practices -> Family Eating Habits and Activities -> Child Eating Behaviour	.200	4.145	0.000	Accepted

DISCUSSION

The Influence of Parenting Style on Children's Eating Behavior

The study findings show that parenting styles have a significant impact on children's eating behavior. Family parenting approaches, such as permissive, authoritarian, and authoritative, influence the dynamics of interaction and communication within the family (23)(24). Authoritative parenting, which fosters a secure attachment between parent and child, is thought to be important for healthy emotional development, which in turn influences healthy eating behaviors. Authoritative parenting, characterized by warmth, responsiveness, clear boundaries, and consistent discipline, fosters a secure attachment between parent and child. This secure attachment is pivotal in healthy emotional development and influences healthy eating behaviours (25). Authoritative parents prioritize a comfortable and warm atmosphere during meals, avoiding conflict or excessive criticism of children's eating habits. They prioritize constructive discussions if there are problems with children's eating patterns. Children raised with this parenting style tend to have self-regulation skills in eating, a positive relationship with food, and a preference for a balanced and nutritious diet and tend to consume more fruits and vegetables compared to those raised under authoritarian or permissive parenting styles (26).

Authoritarian parenting, which emphasizes strict control and discipline without considering a child's emotional needs, can significantly impact a child's eating patterns, often in less-than-ideal ways (26). Authoritarian parents often use punishment to ensure that a child follows the rules about eating, such as depriving a child of a favourite food as a punishment. This approach focuses on obedience, not understanding. Children lose the ability to recognize their own bodily needs, which can lead to unhealthy eating patterns, such as overeating or undereating. Because this parenting style focuses on strict rules and ignores emotional needs, it often creates a negative relationship between children and food (27). Children in this environment tend to lose the ability to recognize their own body signals, experience emotional distress during eating, and develop an unhealthy relationship with food. This approach, while effective in controlling a child's behavior in the short term, can lead to long-term eating problems such as picky eating, overeating, or emotional eating (28). Additionally, strict parenting practices, such as food restriction, may not effectively change children's eating behaviors and could even result in overeating when unsupervised (29). On the other hand, permissive parenting can lead to unhealthy food choices, as permissive parents often allow children to freely select foods, often resulting in preferences for sugary and fatty foods. This aligns with findings that children tend to choose high-calorie foods in the absence of clear parental boundaries (30).

The Influence Feeding Practices on Children's Eating Behavior

The study findings show that Feeding Practices also significantly affect children's eating behavior. Feeding practices, which include the timing, frequency, type of food, portion sizes, and mealtime environment, are crucial in

shaping children's eating habits (31). Regular eating patterns are important to ensure that children meet their nutritional needs. Irregular eating schedules can lead to hunger or overeating, which affects eating behavior. The types of foods provided play an important role, as a varied and balanced diet can foster healthy eating habits that persist into adulthood (32).

Portion sizes must also be considered, with appropriate portions preventing digestive issues or undernutrition (24)(33). The mealtime environment is equally important, as a calm, pleasant atmosphere encourages children to enjoy their food (34). Positive emotional interactions during meals promote healthy eating habits, while stressful or negative environments can lead to irregular eating patterns (30). Allowing children autonomy in choosing their portions and food can help them develop a healthy relationship with food, reducing the risk of eating disorders or nutritional problems such as stunting (23).

Eating Habits and Family Activities as Mediating Variables

The study reveals that eating habits and family activities serve as significant mediating variables in shaping children's eating behavior. Based on the PLS-SEM analysis, these factors partially mediate the relationship between parenting styles, feeding practices, and children's eating patterns. In line with the mediation framework proposed by Jang et al., (27), the results demonstrate that while parenting styles and feeding practices have a direct influence, their effect is either enhanced or diminished depending on the presence of consistent and structured family eating habits. This implies that even when parents apply healthy feeding practices or adopt authoritative parenting, the desired outcomes in children's eating behavior may not be fully realized if family routines around food are lacking. Prior studies support this mechanism, showing that parental modelling, particularly maternal involvement in food selection, preparation, and mealtime routines, plays a pivotal role in shaping children's food preferences and self-regulation(35)(36). Structured family practices, including how food is presented and consumed collectively, foster a more stable environment that supports healthy nutritional behavior in young children (9)(37).

Family eating habits encompass family meal patterns, discipline in maintaining mealtimes, family mealtime practices, and the values instilled regarding food. Consistent family routines surrounding mealtimes and physical activity play an essential role in shaping children's eating behaviours, as children tend to imitate their family members (38). When family eating habits are not well-organized, such as inconsistent mealtimes or unhealthy eating habits, the positive impact of supportive parenting styles promoting healthy eating may be reduced. In contrast, families with regular eating habits that support healthy eating patterns strengthen the influence of authoritative parenting styles, which are more likely to lead to healthy eating habits in children (31). For example, if parents practice a parenting style that encourages children's involvement in mealtime but the family also maintains consistent eating routines and provides healthy food, the influence of this parenting style will be more effective in shaping children's eating behaviours.

Family eating and activity habits help children develop positive attitudes toward healthy foods. Parents who support family mealtimes and provide healthy, nutritious foods can help establish healthy eating patterns in children (19). This routine will gradually become ingrained in children's eating behaviours. Children's eating habits are not only influenced by parenting styles and feeding practices but are also reinforced by the behaviours modelled by parents. Children tend to imitate their parents' behaviours, internalize values and family rules, and learn essential food-related norms, ultimately shaping their eating habits. Healthy eating habits within the family, such as shared family meals, reinforce the message communicated by parents regarding the importance of eating nutritious foods (20). For example, when parents provide healthy foods and eat with their children, it reinforces healthy eating behaviours, creating an environment that supports good eating habits.

Comparison with Previous Studies

The findings of this study are consistent with and meaningfully extend the existing literature on parenting styles and feeding practices in shaping children's eating behaviors. Previous studies, such as those by Kiefner-Burmeister and Hinman (32) and Estlein (24), have underscored the role of authoritative parenting in fostering emotional security, which is linked to healthier dietary patterns in children. This study not only supports those conclusions but also extends them conceptually by integrating family-level routines and habits as a mediating mechanism between parenting style and child eating behavior. Specifically, it demonstrates that authoritative

parenting, characterized by warmth, responsiveness, and structured boundaries, contributes to greater self-regulation and a higher intake of fruits and vegetables, while also fostering more harmonious mealtime interactions.

In contrast, this study also corroborates earlier work on the negative impacts of authoritarian and permissive parenting. Similar to the conclusions drawn by Chen et al. (13) and Balantekin et al. (30), the present research finds that authoritarian practices, including coercion or punishment in feeding, can disrupt children's ability to recognize hunger and satiety cues, potentially contributing to disordered eating behaviors such as emotional eating or food aversions. Additionally, permissive parenting—which often involves a lack of structure and few boundaries—was shown to align with prior findings linking such styles to preferences for high-calorie, low-nutrient foods among children.

In terms of feeding practices, this study reaffirms the importance of consistent mealtime routines, appropriate portion sizes, and emotional climate during meals, in line with studies by Springmann et al. (33) and Harris, Jansen and Rossi (23). What distinguishes the present study, however, is its emphasis on family eating and activity habits as mediating variables; a component not always explicitly addressed in previous models. While earlier research has discussed the influence of parental behavior on child nutrition, this study adds to the literature by showing how family-level habits, such as shared mealtimes and structured food routines, either enhance or attenuate the effectiveness of parenting and feeding strategies.

Moreover, this study contextualizes its findings within the Indonesian public health landscape, where undernutrition and stunting remain pressing concerns. By highlighting maternal involvement and family routines as mediating mechanisms, this study not only supports findings by Chen et al. (13) but also offers new insights into culturally embedded parenting and nutritional challenges specific to Southeast Asia. To enhance generalizability, these findings can be contextualized alongside evidence from other low- and middle-income countries (LMICs), where similar socio-cultural and structural factors influence child nutrition. This cultural lens represents a novel contribution to the literature and holds practical relevance for public health strategies, including Indonesia's National Strategy for Accelerating Stunting Prevention (Stranas Stunting).

Limitations and Cautions

This study acknowledged several limitations: 1) The study does not comprehensively examine additional external factors that could potentially influence children's eating behavior, including the impact of social context, media exposure, and accessibility to nutritious food options. 2) This study assessed family eating habits based on maternal self-reports, which may be subject to recall bias and social desirability bias. To improve the validity of future research, triangulated measurement strategies such as time-use diaries, observational protocols, or direct meal observations are recommended to complement self-reported data and capture more accurate behavioral patterns. Considering these limitations, future research that expands the sample scope and incorporates external variables, along with a more comprehensive research design, would be highly beneficial for deepening the understanding of the factors influencing children's eating behavior.

Recommendations for Future Research

Future studies should focus on addressing the identified limitations. For instance, future research should further investigate the complex mechanisms by which parenting styles and feeding practices influence children's eating behaviors through family habits. Longitudinal and intervention-based studies are recommended to establish causal relationships and to assess the long-term impact of family-based interventions on childhood nutrition outcomes. It is also important to explore the role of cultural and socio-economic factors within different regions of Indonesia, to tailor interventions that are both effective and contextually relevant.

CONCLUSION

This study highlights that feeding practices and parenting styles significantly influence children's eating behaviors, primarily through their indirect effects on family eating habits and activities, which serve as crucial mediating variables. The findings emphasize that children tend to imitate consistent family dietary patterns, amplifying the impact of parental behavior. In the Indonesian context, where malnutrition and stunting remain pressing challenges, addressing these issues requires a family-centered approach that emphasizes parental education.

This research contributes to public health policy by supporting the integration of family-oriented strategies into national initiatives such as the National Strategy for Accelerating Stunting Prevention (Stranas Stunting). Promoting authoritative parenting, diverse feeding practices, and regular family mealtimes can help drive sustainable improvements in child nutrition and support Indonesia's stunting reduction goals.

AUTHOR'S CONTRIBUTION STATEMENT

All authors contributed significantly to the completion of this study. Nadirawati was responsible for the conceptualization, research design, data analysis, and drafting of the original manuscript. Chatarina Suryaningsih supervised the research process, validated the data, and reviewed the methodology and key findings. Felina C. Young contributed to the literature review, coordinated data collection, and provided critical revisions. Hartiah Haroen managed project administration, ensured ethical compliance, and assisted in manuscript editing. Susilowati performed the statistical analysis, supported the interpretation of results, and contributed to the final review and refinement of the manuscript. All authors have read and approved the final version of the manuscript and agree to be accountable for all aspects of the work.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

DECLARATION OF GENERATIVE AI AND AI-ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

During the preparation of this manuscript, the authors used generative AI tools (ChatGPT developed by OpenAI) to assist in language refinement, grammar correction, and improvement of sentence structure. The content, scientific arguments, data interpretation, and final conclusions were entirely conceived, developed, and approved by the authors without any influence or decision-making by the AI. The authors take full responsibility for the integrity and accuracy of the work presented.

SOURCE OF FUNDING STATEMENTS

Jenderal Achmad Yani university

ACKNOWLEDGEMENTS

The researcher expresses heartfelt thanks to Jenderal Achmad Yani University for providing the support and funding necessary for this research and to all individuals who contributed to its successful completion.

BIBLIOGRAPHY

1. Takhelchangbam ND, Saxena D, Singh NP, Singh A. Epidemiology of Double Burden of Malnutrition: Causes and Consequences. Prev Med Res Rev. 2024;1:298–304.
2. Hafid F, Nasrul N, Bungawati A, Ramadhan K. Risk Factors of Stunting in Children Under Two Years of Age in Donggala District Central of Sulawesi. Poltekita J Ilmu Kesehat [Internet]. 2023;17(2):410–420. Available from: https://jurnal.poltekkespalu.ac.id/index.php/JIK/article/view/3045
3. Izah N, Mulyani Y, Desi NM, Hidayah SN, Fatimah OZS, Rakhimah F, et al. Efforts to Accelerate Stunting Reduction in Tegal City, Indonesia. J Res Heal [Internet]. 2024 Aug 1 [cited 2024 Oct 23];14(5):427–38. Available from: http://jrh.gmu.ac.ir/article-1-2458-en.html
4. Taqwin T, Ramadhan K, Hadriani H, Nasrul N, Hafid F, Efendi F. Prevalence of stunting among 10-year old children in Indonesia. J Glob Pharma Technol [Internet]. 2020;12(2):768–75. Available from: www.jgpt.co.
5. Suratri MAL, Putro G, Rachmat B, Nurhayati, Ristrini, Pracoyo NE, et al. Risk Factors for Stunting among Children under Five Years in the Province of East Nusa Tenggara (NTT), Indonesia. Int J Environ Res Public Heal 2023, Vol 20, Page 1640 [Internet]. 2023 Jan 16 [cited 2025 Jan 5];20(2):1640. Available from: https://www.mdpi.com/1660-4601/20/2/1640/htm
6. Yani DI, Rahayuwati L, Sari CWM, Komariah M, Fauziah SR. Family Household Characteristics and Stunting: An Update Scoping Review. Nutrients. 2023;15(1):1–17.

7. Ayu G, Agung A, Wedagama DM, Agung G, Hartini A, Putu N, et al. The Impact Of Stunting Malnutrition Of Orodental Health In Children: A Scooping Review. Interdental J Kedokt Gigi [Internet]. 2023 Dec 23 [cited 2025 Jan 5];19(2):74–9. Available from: https://e-journal.unmas.ac.id/index.php/interdental/article/view/5374
8. Bąk I. Sustainable Development Goals (SDGs): Concept and measurement. Role Financ Mark Achiev Sustain Dev Goals. 2024 Jun 3;15–41.
9. Mulyaningsih T, Mohanty I, Widyaningsih V, Gebremedhin TA, Miranti R, Wiyono VH. Beyond personal factors: Multilevel determinants of childhood stunting in Indonesia. PLoS One [Internet]. 2021 Nov 1 [cited 2025 Jan 5];16(11):e0260265. Available from: https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0260265
10. Verbecque E, Coetzee D, Smits-Engelsman B. Underweight children are agile but lack power. BMC Pediatr [Internet]. 2022 Dec 1 [cited 2024 Oct 23];22(1):1–9. Available from: https://link.springer.com/articles/10.1186/s12887-022-03544-3
11. Mustakim MRD, Irwanto, Irawan R, Irmawati M, Setyoboedi B. Impact of Stunting on Development of Children between 1-3 Years of Age. Ethiop J Health Sci [Internet]. 2022 May 1 [cited 2024 Oct 23];32(3):569–78. Available from: https://www.ajol.info/index.php/ejhs/article/view/226231
12. Shloim N, Edelson LR, Martin N, Hetherington MM. Parenting styles, feeding styles, feeding practices, and weight status in 4-12 year-old children: A systematic review of the literature. Front Psychol. 2015;6(DEC).
13. Chen B, Kattelmann K, Comstock C, McCormack L, Wey H, Meendering J. Parenting styles, food parenting practices and dietary intakes of preschoolers. Nutrients. 2021;13(10):1–15.
14. Malek-Lasater AD, Kwon KA, Horm DM, Sisson SB, Dev DA, Castle SL. Supporting Children's Healthy Development During Mealtime in Early Childhood Settings. Early Child Educ J [Internet]. 2022 Feb 1 [cited 2024 Oct 23];50(2):207–19. Available from: https://link.springer.com/article/10.1007/s10643-020-01137-2
15. Zohar AH, Lev-Ari L, Bachner-Melman R. Two to Tango? The Dance of Maternal Authority and Feeding Practices with Child Eating Behavior. Int J Environ Res Public Heal 2021, Vol 18, Page 1650 [Internet]. 2021 Feb 9 [cited 2024 Oct 19];18(4):1650. Available from: https://www.mdpi.com/1660-4601/18/4/1650/htm
16. Titaley CR, Ariawan I, Hapsari D, Muasyaroh A, Dibley MJ. Determinants of the Stunting of Children Under Two Years Old in Indonesia: A Multilevel Analysis of the 2013 Indonesia Basic Health Survey. Nutr 2019, Vol 11, Page 1106 [Internet]. 2019 May 18 [cited 2023 Mar 4];11(5):1106. Available from: https://www.mdpi.com/2072-6643/11/5/1106/htm
17. Elisaria E, Mrema J, Bogale T, Segafredo G, Festo C. Effectiveness of integrated nutrition interventions on childhood stunting: a quasi-experimental evaluation design. BMC Nutr [Internet]. 2021 [cited 2024 Jan 27];7. Available from: https://doi.org/10.1186/s40795-021-00421-7
18. Mou Y, Jansen PW, Raat H, Nguyen AN, Voortman T. Associations of family feeding and mealtime practices with children's overall diet quality: Results from a prospective population-based cohort. Appetite. 2021 May 1;160:105083.
19. Snuggs S, Harvey K. Family Mealtimes: A Systematic Umbrella Review of Characteristics, Correlates, Outcomes and Interventions. Nutrients [Internet]. 2023 Jul 1 [cited 2025 Jan 6];15(13):2841. Available from: https://www.mdpi.com/2072-6643/15/13/2841/htm
20. Sorooshian S. Journal of Cleaner Production. 2024 [cited 2025 Jan 5]. The sustainable development goals of the United Nations: A comparative midterm research review. Available from: https://www.sciencedirect.com/science/article/pii/S0959652624017207
21. Hair JFJ, Hult GTM, Ringle CM, Sarstedt M. A Primer On Partial Least Squares Structural Equation Modeling (PLS-SEM). 3th ed. 2021. 385 p.
22. Hair JF, Hult GTM, Ringle CM, Sarstedt M. Partial Least Squares Structural Equation Modeling (Pls-Sem) Third Edition. Third Edit. Angewandte Chemie International Edition, 6(11), 951–952. Los Angeles: SAGE Publications, Inc.; 2022.
23. Harris HA, Jansen E, Rossi T. 'It's not worth the fight': Fathers' perceptions of family mealtime interactions, feeding practices and child eating behaviours. Appetite [Internet]. 2020;150(January):104642. Available from: https://doi.org/10.1016/j.appet.2020.104642

24. Estlein R. Parenting as a Communication Process: Integrating Interpersonal Communication Theory and Parenting Styles Conceptualization. J Fam Theory Rev [Internet]. 2021 Mar 1 [cited 2024 Oct 23];13(1):21–33. Available from: https://onlinelibrary.wiley.com/doi/full/10.1111/jftr.12407
25. Arlinghaus KR, Vollrath K, Hernandez DC, Momin SR, O'Connor TM, Power TG, et al. Authoritative parent feeding style is associated with better child dietary quality at dinner among low-income minority families. Am J Clin Nutr [Internet]. 2018;108(4):730–6. Available from: https://doi.org/10.1093/ajcn/nqy142
26. Burke MP, Jones SJ, Frongillo EA, Blake CE, Fram MS. Parenting styles are associated with overall child dietary quality within low-income and food-insecure households. Public Health Nutr [Internet]. 2019 Oct 1 [cited 2024 Oct 23];22(15):2835–43. Available from: https://www.cambridge.org/core/journals/public-health-nutrition/article/parenting-styles-are-associated-with-overall-child-dietary-quality-within-lowincome-and-foodinsecure-households/0C0D3569269E36C83BCE051B10EC45C0
27. Jang M, Brown R, Park M. Mediating effect of the parent-child relationship on the association between parenting stress and children's eating behaviors. BMC Public Health [Internet]. 2021 Dec 1 [cited 2025 Jan 8];21(1):1–10. Available from: https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-021-12052-5
28. Brown M, Roman N V. Nutritional Knowledge, Parenting Styles and Feeding Practices of a South African Sample of Parents. Ecol Food Nutr [Internet]. 2019 Nov 2 [cited 2025 Jan 8];58(6):529–47. Available from: https://www.tandfonline.com/doi/abs/10.1080/03670244.2019.1641800
29. Burnett AJ, Worsley A, Lacy KE, Lamb KE. Moderation of associations between maternal parenting styles and Australian pre-school children's dietary intake by family structure and mother's employment status. Public Health Nutr. 2019;22(6):997–1009.
30. Balantekin KN, Anzman-Frasca S, Francis LA, Ventura AK, Fisher JO, Johnson SL. Positive parenting approaches and their association with child eating and weight: A narrative review from infancy to adolescence. Pediatr Obes. 2020;15(10):1–15.
31. López-Gil JF. The Eating Healthy and Daily Life Activities (EHDLA) Study. Children. 2022;9(3):1–24.
32. Kiefner-Burmeister A, Hinman N. The Role of General Parenting Style in Child Diet and Obesity Risk. Curr Nutr Rep [Internet]. 2020 Mar 1 [cited 2024 Oct 23];9(1):14–30. Available from: https://link.springer.com/article/10.1007/s13668-020-00301-9
33. Springmann M, Spajic L, Clark MA, Poore J, Herforth A, Webb P, et al. The healthiness and sustainability of national and global food based dietary guidelines: Modelling study. BMJ. 2020;370:1–16.
34. Moss RH, Conner M, O'Connor DB. Exploring the effects of positive and negative emotions on eating behaviours in children and young adults. Psychol Health Med [Internet]. 2021 Apr 21 [cited 2024 Oct 23];26(4):457–66. Available from: https://www.tandfonline.com/doi/abs/10.1080/13548506.2020.1761553
35. Mahmood L, Flores-Barrantes P, Moreno LA, Manios Y, Gonzalez-Gil EM. The influence of parental dietary behaviors and practices on children's eating habits. Nutrients [Internet]. 2021 Apr 1 [cited 2024 Oct 23];13(4):1138. Available from: https://www.mdpi.com/2072-6643/13/4/1138/htm
36. Fahmida U, Htet MK, Ferguson E, Do TT, Buanasita A, Titaley C, et al. Effect of an integrated package of nutrition behavior change interventions on infant and young child feeding practices and child growth from birth to 18 months: Cohort evaluation of the baduta cluster randomized controlled trial in east Java, Indonesia. Nutrients. 2020 Dec 1;12(12):1–16.
37. Adebiyi BO, Goldschmidt T, Benjamin F, Sonn IK, Rich E, Roman N V. Enablers and barriers to effective parenting within the first 1000 days: an exploratory study of South African parents and primary caregivers in low socio-economic communities. BMC Public Health [Internet]. 2022 Dec 1 [cited 2024 Sep 10];22(1):1–13. Available from: https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-022-13179-9
38. Espinosa-Curiel IE, Pozas-Bogarin EE, Lozano-Salas JL, Martínez-Miranda J, Delgado-Pérez EE, Estrada-Zamarron LS. Nutritional Education and Promotion of Healthy Eating Behaviors Among Mexican Children Through Video Games: Design and Pilot Test of FoodRateMaster. JMIR serious games [Internet]. 2020 Apr 13 [cited 2024 Oct 23];8(2):e16431. Available from: http://www.ncbi.nlm.nih.gov/pubmed/32281539