From Picky Eaters to Nourished Explorers: Unveiling the Power of Responsive Feeding in Enhancing Young Children’s Nutrition

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Abstract
Implementing responsive feeding is essential for modifying the nutritional status and overall well-being of young children. The aim of this narrative review was to provide a thorough synthesis of the current evidence on responsive feeding and its impact on the nutritional status of young children. Searches were conducted in PubMed and Medline with keywords “responsive feeding” and “young children”. The inclusion and exclusion criteria were defined to choose the most pertinent studies. The initial search yielded 106 articles with a total of 22 full-text articles examined, 12 of which were appropriate for inclusion. The review emphasized the function of responsive feeding in maintaining healthy eating habits, reducing childhood obesity, and promoting optimal growth and development in young children. The study highlighted the significance of early nutrition treatments that prioritize responsive feeding to enhance nutritional quality and foster healthy eating habits during early childhood. It also discussed the difficulties that caregivers experienced when implementing responsive feeding methods, such as competing societal norms and external influences. Furthermore, the review identified data gaps and recommended additional studies to investigate the long-term impacts of responsive feeding on children’s nutrition and health outcomes. In conclusion, the narrative review underlines the significance of responsive feeding in supporting optimal nutrition and healthy eating habits in young children.

Keywords: children, nutrition, responsive feeding, nutritional status

Abstrak

Kata Kunci: anak, gizi, pemberian makanan responsif, status gizi
Introduction

Responsive feeding is an important part of early childhood nutrition that promotes healthy growth and development in children aged 25-59 months. This vital phase is marked by rapid physical and cognitive growth, making it an ideal time to instil healthy eating habits and cultivate a favourable relationship with food (Workie et al., 2020). Responsive feeding is a feeding technique that entails identifying and responding to children’s hunger and satiety signs while also fostering a nurturing and supportive feeding environment (World Health Organization [WHO], 2018). For instance, feed infants directly and assist older children, feed gently and carefully, encourage but do not force them to eat, chat to the child and maintain eye contact.

An increasing quantity of study supports the importance of responsive feeding in children aged 25-59 months. The purpose of this literature review is to examine the available information and emphasize the relevance of responsive feeding habits during this age range. Parents, caregivers, and healthcare professionals can implement measures that improve children’s nutritional intake, promote healthy eating behaviors, and support their general well-being by understanding the relevance of responsive feeding.

Children develop significantly physically and cognitively between the ages of 25 and 59 months. They go through development spurts, perfect their motor skills, and continue to progress in terms of linguistic and cognitive capacities (Marotz, 2014). Adequate nutrition is critical during this time to ensure optimal growth and development (Anater et al., 2018). Responsive feeding strategies guarantee that children receive the nutrition and energy they require to fulfil their changing demands (Pérez-Escamilla et al., 2021). Caregivers can provide adequate portions of nutrient-rich foods to children by identifying and responding to their hunger and satiety cues, fostering healthy growth and preventing nutritional deficits (Redsell et al., 2021).

Aside from delivering appropriate nutrition, responsive feeding techniques have a significant impact on children’s eating habits. This age group is marked by the development of autonomy and independence, and responsive feeding assists children in making choices and actively participating in the eating process (United Nations Children’s Fund [UNICEF], 2017). Children are encouraged to try new foods, flavors, and textures when caregivers establish a supportive and responsive eating environment (Pérez-Escamilla et al., 2021). The practice helps to create a diversified taste and supports the acceptance of a wide variety of healthful foods. Furthermore, responsive feeding aids in the development of self-regulation skills in children, helping them to identify their own hunger and fullness cues (Dev et al., 2017). This self-regulation promotes healthy portion management and prevents overeating and undereating, promoting a balanced and intuitive eating approach.

According to previous studies, responsive feeding between the ages of 25 and 59 months offers far-reaching benefits for children’s overall development (Daniels, 2019). In addition to nutrition and eating habits, responsive feeding techniques have a positive impact on cognitive and socio-emotional development. According to previous study, children who receive responsive feeding have better language skills, cognitive capacities, and problem-solving ability (Black et al., 2022). Positive feeding relationships create a loving atmosphere, increasing emotional well-being and lowering the chance of feeding issues or negative food associations (Black et al., 2022; Daniels, 2019; Finnane et al., 2017). Furthermore, responsive feeding promotes to a secure and trusting attachment, providing the groundwork for healthy food relationships and fostering beneficial caregiver interactions.

Furthermore, the importance of responsive feeding at this age goes beyond immediate developmental effects. Longitudinal study has demonstrated that responsive feeding practices in early infancy have long-term effects on children’s health and well-being (Hughes et al., 2016; Saltzman et al., 2016). Children who have responsive feeding are more likely to retain healthy eating habits, are less likely to become obese, and are less likely to acquire diet-related chronic disorders later in life (Cristina Lindsay et al., 2017; Hughes et al., 2016). However, the role of caregiver in knowledge, attitude and practice of responsive feeding could influence eating behavior (Gebrur et al., 2021), leading to affect the nutrition status of the children (Kalid et al., 2019). These findings highlight the importance of early
intervention and support in developing good eating habits that can last into adulthood.

Furthermore, responsive feeding is critical in children aged 25-59 months. It promotes optimal growth, encourages healthy eating habits, and aids in general development and well-being. Caregivers can provide a compassionate and supportive feeding environment that encourages appropriate food choices, self-regulation, and good connections with food by noticing and responding to children’s feeding cues. Implementing responsive feeding methods at this important age range establishes the foundation for a lifetime of healthy eating habits and long-term health advantages.

Therefore, the purpose of this article is to provide a thorough narrative assessment of prior studies on responsive feeding. Prior to conducting research, reviewing the literature is essential since it is an ontological and epistemological process that clarifies the state of knowledge. (Winahyu & Piaseu, 2023). Understanding the importance of responsive feeding in early childhood nutrition and development is critical for encouraging healthy eating habits and general well-being in children. The purpose of this narrative review is to summarize and assess the existing literature in the topic of responsive feeding, identifying major findings, trends, and research gaps.

**Method**

A systematic strategy was used to gather and assess relevant research studies, and empirical evidence for the narrative review on responsive feeding in children aged 25-59 months. A thorough search technique is essential for locating relevant papers and resources. Peer-reviewed publications were found using databases including PubMed and Medline with keywords "Responsive feeding," AND “young children”.

The inclusion and exclusion criteria were established to select the most relevant studies. The age range (25-59 months), emphasis on responsive feeding, and publishing in peer-reviewed publications in years 2013-2023 were the inclusion criteria. Studies that are not available in English, review article, and were not relevant specific study question may be excluded. Following the initial search, the articles are vetted using the inclusion and exclusion criteria. Title and abstracts have been reviewed to discover possibly relevant papers as a part of the screening process. The full-text articles of the chosen studies then evaluated for inclusion in the literature review.

**Result and Discussion**

There are 12 selected published articles from 2016-2023 to be included in the review. Data The potential of responsive feeding in children aged 25-59 months is constantly highlighted in research findings, revealing its tremendous impact on several aspects of children's well-being, including nutritional status, eating behaviors, and overall development. Also, previous studies has been comparing fussy eating patterns or picky eater versus responsive feeding in children have provided important insights into the impact of feeding practices on children’s eating behaviors and general well-being.

Parents and caregivers are frequently concerned about fussy eating, which is characterized by selective food choices, refusal of particular foods, and mealtime disputes. According to previous study, picky eating habits might have a negative impact on children's nutritional intake, growth, and general health (Markides et al., 2022; Wolstenholme et al., 2020). However, the study has shown that responsive feeding practices can help to reduce fussy eating tendencies and promote healthy eating habits (Bergmeier et al., 2016).

Improved nutritional status has been linked to responsive feeding behaviors in children aged 25-59 months. According to previous studies, children who get responsive feeding are more likely to consume a diverse range of nutrient-rich foods, resulting in higher overall nutrient intake and a lower risk of nutrient deficiencies (Pérez-Escamilla et al., 2021; United Nations Children’s Fund (UNICEF), 2020). These techniques help youngsters establish a good attitude toward food and encourage them to try various flavours and textures, all of which contribute to a well-rounded diet.

Responsive feeding is critical in building positive eating habits in youngsters. According to research, children who get responsive feeding are more likely to acquire self-regulation skills, which allow them to detect and respond correctly to hunger and satiety cues. This results in a healthier relationship with food, preventing overeating or undereating. Because children are encouraged to make choices and engage actively in their own eating experiences, responsive feeding supports the development of autonomy and independence during mealtimes.
Responsive feeding provides a positive caregiving relationship and strengthens the parent-child attachment. Responding appropriately to their child's feeding cues fosters a sense of trust and security between them (Markides et al., 2022). This loving relationship fosters a healthy bond, which benefits the child's eating experiences as well as their general emotional and social development.

The impact of responsive eating persists into early life. According to previous study, children who are exposed to responsive feeding in their early years are more likely to develop healthy eating habits and are less likely to develop obesity and other diet-related chronic disorders later in life (Cristina Lindsay et al., 2017). Moreover, responsive feeding could be adopted in group well child in primary care setting despite the benefit for individual young child and the caregiver (Budge et al., 2023). The foundations established during the responsive feeding phase contribute to long-term health outcomes, highlighting the significance of early intervention and support.

Table 1. Reviewed Articles of Responsive Feeding in Young Children

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<td>1</td>
<td>Workie (2020)</td>
<td>A community-based cross-sectional study</td>
<td>The initiation of supplemental feeding in children below the age of 6 months or above 6 months has been found to have a noteworthy impact on child development. Children who obtain a dietary diversity score below 4 are 2.1 times more prone to experiencing developmental delays. There exists a substantial correlation between childhood developmental delay and the occurrence of stunting and underweight. Several factors have been identified as potential contributors to an increased risk of developmental delay. These factors include stunted growth, birth order, delayed introduction of supplemental feeding, and a low minimum dietary score.</td>
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<td>2</td>
<td>Saltzman (2016)</td>
<td>This longitudinal observational study included (n = 260) mothers and children from the STRONG Kids Panel Survey. At Wave 1, children were an average of 37 months old, and at Wave 2 children were an average of 57 months old.</td>
<td>The study found that maternal behavioral economics (BE) was associated with an increased likelihood of employing nonresponsive feeding practices, such as emotion regulation, restriction for health, pressure to eat, and food as a reward. This relationship was mediated by higher levels of distress responses to children's negative emotions. The serial mediation model revealed a significant association between maternal body esteem (BE) and an increased tendency to employ Distress responses. This, in turn, indirectly predicted a higher child body mass index (BMI) percentile through the utilization of Food as Reward feeding practices.</td>
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<td>3</td>
<td>Hughes (2016)</td>
<td>Longitudinal study</td>
<td>The study found a correlation between the indulgent feeding style and an increase in children's BMI z-score from 4.8 years of age to 18 months later. This finding further reinforces the significance of feeding styles in impacting a child's weight status. There was no significant correlation found between authoritative, authoritarian, and uninvolved feeding methods and an increase in child BMI z-score or weight growth. The indulgent feeding style occurs when parents impose few expectations on their children during mealtime and</td>
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<td>4</td>
<td>Black et al. (2022)</td>
<td>A 2-phase Delphi technique. This procedure involves a multi-stage process wherein experts in the relevant field offer feedback on a set of questions. These questions are then adjusted based on the initial response and subsequently returned to the experts for more input.</td>
<td>The objective of this study was to address the existing conceptual limitations and reconsider the idea of responsive feeding. This was achieved by integrating the principles of bidirectional mother-infant responsiveness and early learning into the development and validation of a measure for assessing responsive feeding. The study conducted an analysis to identify nine elements reported by mothers that effectively distinguished between proximal and distal responsiveness, as defined by observation, across a group of Bangladeshi mothers and their infants aged 6-18 months. The inquiries pertaining to responsive feeding that were indicative of distal responsiveness, such as the mother's positioning of the kid to maintain visual contact, seeing the child's emotional state as positive, and exerting pressure on the child to consume food, underscore the significance of taking into account the emotional atmosphere or demeanor during mealtime. The concept of proximal responsivity was found to be linked to a combination of maternal-reported perceptions and behaviors. These encompassed a range of experiences, such as mothers expressing feelings of worry and concern regarding their child's inadequate food intake, as well as engaging in verbal communication and exhibiting positive emotions while their kid was engaged in feeding activities. The research encompassed various indicators of maternal and child responsivity, employing observation coding that relied on a well-established measure. The study ensured a high level of agreement among observers, indicating strong inter-observer reliability. Additionally, the questions pertaining to responsive feeding were developed using a rigorous 2-phase Delphi procedure, validated specifically for use in Bangladesh. Furthermore, these questions demonstrated a significant correlation with video-recorded observations of mother-child dyadic responsivity.</td>
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<td>5</td>
<td>Gebru et al. (2021)</td>
<td>a school-based cross-sectional study</td>
<td>There was no significant association discovered between the practice of monitoring by caregivers and any of the eating behavior scores. The findings of this study indicate a positive correlation between food approach behaviors and the implementation of food restriction by caregivers. Conversely, a negative correlation was observed between food approach behaviors and the practice of pressuring children to eat by caregivers. Additionally, there was a positive correlation between food avoidant behaviors and caregivers' utilization of pressure to eat, while the food</td>
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| 6  | Kalid et al. (2019)     | Quasi Experiment                     | Fussiness scale exhibited a negative correlation with caregivers' implementation of restriction.  
Children whose caregivers engage in food restriction have higher levels of food responsiveness, emotional overeating tendencies, heightened enjoyment of food, and increased desire for beverage consumption compared to children whose caregivers do not practice food restriction. In contrast, children whose caregivers employed pressure to eat exhibited increased food fussiness, heightened responsiveness to feelings of satiety, and a propensity for delayed eating. |
| 7  | Budge et al. (2023)     | Convergent mixed-methods design      | The caregivers responded well to the collaboration between primary care and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) in promoting responsive feeding within the setting of the Growing Well Child Clinic (GWCC). However, there was no observed correlation between this collaboration and any improvements in newborn weight-for-length.  
The implementation of a collaborative approach between clinicians and WIC nutritionists, utilizing a group-based model for delivering well-child care, aimed at creating an environment where caregivers feel at ease discussing their nutrition-related beliefs and practices with both their peers and healthcare providers. This approach was found to have a subjective impact on certain caregivers' behavior, but did not result in improvements in weight-for-length growth patterns. Additionally, caregivers reported varying levels of adoption of responsive feeding practices.  
Four prominent themes related to feeding. 1) The access to nutritious foods for participants of the Women, Infants, and Children (WIC) program is constrained by structural barriers. 2) The decision-making process for
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<td>Rossiter et al. (2022)</td>
<td>Quantitative</td>
<td>In contrast to parents who have numerous children and parents with children aged 3-5 years, first-time parents and parents with younger children demonstrate a higher degree of adherence to certain demanding responsive feeding practices, such as refraining from exerting pressure on their children to consume food. Parents often have well-meaning intentions when they attempt to influence their children's eating habits. However, these intentions can sometimes align with ineffective food-related behaviors, like pressuring, rewarding, and restricting. Due to their ability to promote motivations for eating that are disconnected from appetite and self-regulation, these manipulative strategies may prove to be unproductive and even detrimental.</td>
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<td>9</td>
<td>Paul et al. (2018)</td>
<td>A single-center clinical trial</td>
<td>The trial, which spanned a duration of three years, involved a total of 232 dyads consisting of mothers and children. This accounted for approximately 83.2% of the total participants. The average age of the moms was 28.7 years, with 86% of them identifying as Caucasian and 86% having private insurance coverage. The study found that children who were part of the responsive parenting group had a slightly lower average BMI z score at 3 years old compared to the control group (0.13 in the responsive parenting group versus 0.15 in the control group). The absolute difference between the two groups was 0.28 (95% confidence interval, 0.53 to 0.01), and this difference was statistically significant with a p-value of 0.04. There was no significant difference observed in the mean BMI percentiles between the responsive parenting group (47th percentile) and the control group (54th percentile).</td>
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<td>10</td>
<td>Nagge et al. (2022)</td>
<td>Qualitative study</td>
<td>Discussions with parents have unveiled that the familial eating environment is subject to a multitude of circumstances that undergo daily fluctuations and necessitate adaptation according to the child's developmental stage. Parents saw family meals as a valuable occasion for fostering quality time and exemplifying positive dietary practices. Nevertheless, they encountered several obstacles at mealtimes, notably the issue of perceived selective eating behaviors. Parents demonstrated an awareness of their children's hunger and satiety cues, with a particular emphasis on attending to satiety signals when their children consumed substantial amounts of food.</td>
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<td>Numerous parents employed the practice of utilizing food as a form of incentive to motivate their children to consume larger quantities, however cognizant of the potential consequences associated with the cultivation of unfavorable behavioral patterns. Irrespective of the multiple circumstances that exert an influence on the process of feeding, dietitians possess the ability to collaborate with families in order to cultivate a responsive feeding environment.</td>
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<td>11</td>
<td>Hromi-Fiedler et al. (2020)</td>
<td>Five counselling cards about Responsive Feeding were developed and tested in 4 phases and Focus Group Discussion.</td>
<td>The outcomes of the Focus Group Discussion (FGD) informed modifications made to all cards in order to enhance understanding and align with cultural norms. Based on the group education sessions, the counseling cards were found to include significant RF messages that are characterized by specificity, clarity, and ease of implementation. Healthcare providers expressed strong support for the RF counseling cards, emphasizing their necessity and usefulness in the integration of the Community-based Infant and Young Child Feeding Counseling Package (C-IYCFCP) in Ghana.</td>
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<td>12</td>
<td>Fernandes et al. (2021)</td>
<td>Quantitative</td>
<td>The study revealed a positive correlation between the supportive emotional responses of mothers, such as problem-focused, emotion-focused, and expressive encouragement reactions, and their implementation of responsive feeding strategies, including encouraging, modeling, and teaching good food-related behaviors. In contrast, the adverse responses exhibited by mothers (such as distress, punitive measures, and minimizing reactions) are found to have a positive correlation with nonresponsive feeding behaviors (such as using food as a reward or emotional regulation, and exerting pressure to eat), while simultaneously having a negative correlation with responsive feeding practices.</td>
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Previous study reported the link between authoritative feeding styles and healthy food intake in children. It emphasizes the significance of setting proper limits and being responsive to the needs of children. Moreover, responsive parenting intervention shows that it has a favorable influence on childhood weight outcomes, demonstrating that interventions have the ability to promote healthy weights in children. Another study looks at emotional response as a mediator between maternal binge eating, feeding behaviors, and child weight. It implies that emotional reactivity plays a role in the development of these relationships over time (Paul et al., 2018) (Workie et al., 2020).

Therefore, several previous studies consistently show that responsive feeding is an effective technique for children aged 25-59 months. It improves nutritional status, eating habits, overall development, parent-child bonding, and has long-term health and well-being ramifications. Implementing responsive feeding techniques during this key era helps children develop good eating habits, positive mealtime experiences, and optimal growth and development.

**Conclusion**

The previous studies provide important insights into the relationship between responsive feeding practices, feeding practices of caregivers, and their impact on children’s eating behaviors and weight outcomes. Understanding responsive feeding by taking cultural and socioeconomic issues into account is necessary for health of children. It underlines the importance of a complete strategy that goes beyond typical procedures. Positive caregiver-child relationships are critical for encouraging good eating behaviors among young children. It emphasizes the need of interventions aimed at improving these interactions. However, many of the studies relied on caregivers’ self-reported data on feeding procedures, eating habits, and weight results. This reliance on self-reporting raises the prospect of recollection bias or social desirability bias, in which caregivers provide responses that they believe are more socially acceptable or desired. This can result in mistakes or discrepancies in the provided data, thereby impacting the conclusions’ validity and dependability. In future research, objective measurements or observational methods could be used to supplement self-reported data and improve the accuracy of the results.

**References**


