Advances in research on responsive feeding and children's eating behaviors

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Abstract

Background: Given that the formation of eating behaviors in childhood is largely dependent on parental feeding, it is necessary to consider eating behaviors along with feeding behaviors when exploring child nutrition. Responsive feeding can not only promote the development of self-regulation ability, prevent overweight and obesity, and develop healthy dietary behaviors but also enhance the psychosocial ability, cognitive ability, and language ability of infants. It is of great significance for the growth and development of infants to identify whether the feeding behavior of caregivers is responsive feeding as early as possible. Methods: The progress of the literature summarizes the relevant concepts, evaluation tools, and the relationship between responsive feeding and dietary behavior. Results: This is a fact that China lacks the unified response feeding definition and responsive feeding evaluation tools suitable for homes in China. The relationship between responsive feeding and dietary behavior is in the stage of infancy, and systematic response feeding and dietary behavior have not been formed. Conclusion: It is time to pay attention to the dietary behavior of Chinese children. Intervening measures such as promoting the application of responsive feeding should be actively carried out, accordingly, childhood obesity can be prevented.

Keywords: responsive feeding; children; dietary behavior; review
Background

Childhood is a critical period of physical development and maturation of organ function, and children have unique nutritional needs at all stages of growth. However, due to imperfect digestive systems and caregiver-dependent feeding processes, children are often exposed to many nutritional problems such as undernutrition, hidden hunger, and overnutrition [1, 2]. Globally, one third of children under the age of five still do not have access to the nutrients they need to thrive [2]. To address these challenges, it is important not only to provide children with healthy foods but also to guide them in developing healthy eating behaviors. Given that the formation of eating behaviors in childhood is largely dependent on parental feeding, it is necessary to consider eating behaviors along with feeding behaviors when exploring child nutrition. Parental feeding behaviors include non-responsive and responsive feeding, which are mainly distinguished from feeding on the basis of whether they are responsive to the needs of infants and young children [1, 3]. Responsive feeding can not only promote the development of self-regulation ability, prevent overweight and obesity, and develop healthy dietary behaviors but also enhance the psychosocial ability, cognitive ability, and language ability of infants [4, 5]. Therefore, it is of great significance for the growth and development of infants to identify whether the feeding behavior of caregivers is responsive feeding as early as possible. At present, the assessment tools for compliant feeding in China are not perfect, and the research on compliant feeding is mostly cross-sectional survey. There is a lack of longitudinal research and long-term follow-up on compliant feeding. The research on responsive feeding in China is in its infancy, and it only stays in the policy call and the introduction of the concept. In this paper, we will review the domestic and international literature, analyze the research progress of responsive feeding and eating behavior, and provide some theoretical basis for future exploratory research.

Responsive feeding

Overview of responsive feeding

Responsive feeding is distinguished from non-responsive feeding by emphasizing the feeding process in which parents and primary caregivers develop sensitive and responsive behaviors in response to the signals given by children when they eat and their psychomotor abilities. The concept is derived from on-demand and guided feeding and is based on the theory of the responsive parenting model, which advocates that the feeding process should focus on the integration of psychosocial and child psychology. According to the responsive parenting model, responsive feeding consists of four components: the feeding environment, signals of satiety and hunger, recognition and response by the feeder, and predictable responses by the child [6]. This means providing an interactive but supervised, organized, and distraction-free feeding environment at mealtimes, starting feeding when infants signal hunger (e.g., smacking their lips and putting their hands to their mouths), and stopping feeding when infants signal fullness (e.g., resistance to food, physical avoidance of pushing) [7]. Encourage feeding behaviors that encourage children to eat on their own, which will enhance self-regulation in eating and support cognitive and emotional development [8]. The role of the feeder in responsive feeding has recently expanded from just the parent and primary caregiver to the caregiver [8]. It is evident that the concept of responsive feeding has been increasingly fleshed out over time.

As the research on responsive feeding in China is in its infancy, the concept is basically defined by foreign research theories, and there is still a lack of local theoretical definitions applicable to China.

Assessment tools for responsive feeding

There are approximately 34 assessment tools on responsive feeding, which can involve the assessment of children of all ages from 0-12 years. However, most of the assessment tools are not comprehensive and have not been rigorously tested for reliability and validity, and the quality of the assessment tools is not rigorous. Current instruments that have undergone rigorous reliability testing include the Feeding Practices and Structure Questionnaire (FPSQ), the Family Food Behavior Survey, the Comprehensive Feeding Practice Questionnaire, and the Responsive Feeding (Response Feeding Assessment Scale) and the Infant Responsive Feeding Scale [9-13]. The FPSQ was developed by Janssen for infants and toddlers aged 2-5 years [9]. The scale was extended and validated for low-income parents to form the FPSQ-28 scale, but lacks assessment of racial differences [14]. The Family Food Behavior Survey was developed by McCurdy for children 2-11 years of age with a broader age range of children and has been assessed with samples of whites, blacks, Hispanics, non-Hispanics, and other races to varying degrees, but the assessment is limited to self-report, and its results may be influenced by subjective perceptions [10]. The Comprehensive Feeding Practices Questionnaire developed by Mushler-Eizenman for children aged 1.5-8 years with a broader age range, which was cross-culturally adapted in Brazil to assess both parents of children, but lacks assessment of racial differences [11, 15]. The Responsiveness to Feeding Scale developed by Sall et al. [12]. The Responsive Feeding Scale was developed for children in Cambodia to assess active and responsive feeding in children aged 6-23 months and was tested for reliability. The scale is suitable for pre-post comparisons before and after the intervention study, but the responsive feeding tool was developed in a short period of time and still needs further validation with a large sample of data in different contexts. In Taipei, China, C.L. Chen et al. developed a scale for assessing mothers' responsive feeding in 2020 for breastfed infants aged 0-3 months, which filled the gap in Taiwan for effective assessment of infants and toddlers for responsive feeding and provided effective theoretical support for subsequent guidance on responsive feeding interventions [13]. However, given that children at this stage cannot express themselves, their feeding is only measured based on the mothers’ self-report, which may affect the objectivity and authenticity of their assessment [13]. And China still lacks a responsive feeding assessment tool for the mainland population. In the future, China will develop a comprehensive assessment tool for responsive feeding that is suitable for our local population based on Chinese cultural background and dietary habits.

Eating behavior

Overview of children's eating behavior

Eating behavior refers to a food tendency, determined by people's perceptions of food and health, expressed in their different digestive activities, such as food selection and purchase, type and frequency of food consumption, time and place, how and with whom they eat [16, 17]. These digestive activities are ultimately categorized into two eating behaviors: the satiety response and the food response. The satiety response refers to the regulation of satiety in response to energy needs during food intake and reflects a stable appetite system, whereas the food response refers to the tendency to overeat at the sight or smell of food, controlled by hedonic desires [18]. The satiety response and food response suggest the individual's ability to eat and self-regulate, with low satiety reactivity and high food reactivity associated with binge eating and overweight [19]. Both indicate the presence of eating behavior problems.

Eating behavior problems are problems of excessive preoccupation with food, weight body image, and a range of abnormal eating behaviors that occur in children without organic disease who are severely picky or paranoid eaters [20]. Eating behavior problems, also known as feeding disorders, are persistent eating or eating-related behavioral disturbances that result in changes in eating, digestion, and absorption that significantly affect physical health and psychosocial functioning [21]. Some researchers have limited the meaning of eating behavior problems. For example, Kitzner defines eating behavior problems as 'feeding difficulties', which include only behaviors such as poor appetite, severe pickiness, fear of eating, etc. [22]. Haywood defines them as poor appetite, a single type of diet, reluctance to try new foods, difficulty eating on their own, and dairy products [23]. Haywood defines it as poor appetite, a single type of diet,
unwillingness to try new foods, difficulty in self-feeding, and excessive dairy consumption. Our scholar, Jin Xinming, defines eating behavior problems as eating-related problems, including slow eating (meal time greater than 25 minutes), food preference, meal distraction, doing other things while eating, refusing to eat certain foods, eating less, unwillingness to try new foods, irregular meal location, and disinterest in food [24].

Assessment tools for children’s eating behavior problems
Regarding the assessment of children’s eating behavior problems, domestic and foreign scholars have developed standardized psychological scales for measuring children’s eating behavior [25, 26]. The Dutch Eating Behavior Questionnaire child-version, the Children’s Eating Behaviour Questionnaire, and the DSM-5 manual [21, 27]. The Children’s Eating Behaviour Questionnaire (BEBOQ) was developed by Llewellyn et al. at the University of London to assess the eating behaviour of infants who are exclusively breastfed without any complementary foods in the early years of life, and is now widely used in the UK [25]. The Dutch Eating Behavior Scale for Children was developed by Van Strien et al. This scale is mainly applicable to school-aged children aged 7 to 12 years and can be used to assess restrictive, external, and emotional eating in this age group [26]. The Children’s Eating Behavior Scale developed by Wardle is mainly applicable to assess the eating behavior of children aged 2 to 13 years and it focuses on children’s food reactions, emotional eating and satiety [21]. The DSM-5 manual focuses on the assessment of children’s eating behaviors such as bulimia, anorexia, anorexia nervosa, restrictive eating, and other maladaptive eating behaviors. However, cross-cultural adaptation is required when applied to countries and regions with different cultural backgrounds [27].

The assessment of children’s eating behavior in China is mostly done by self-designed questionnaires, which can involve children at all stages of infancy, preschool, and school age. Chinese scholars have tested the BEBOQ according to the differences in feeding habits between China and the West and have developed a Chinese version of the BEBOQ, which is applicable to the assessment of eating behavior and appetite of lactating infants in China, but further validation with a large sample and multiple populations is still needed [28]. The Identification and Management of Feeding Difficulties (IMFeD) was developed by Jin Xinming et al. to assess children aged 1–6 years in terms of poor appetite, food preference, poor eating habits, excessive parental concern, fear of eating, and potential disease status, but the specific reliability and validity of the questionnaire have yet to be tested [29]. Liu Honghua and Chen Jinjin et al. developed the Children’s Eating Behavior Questionnaire for children aged 1–3 years to assess their eating habits. Liu HH, Chen JJ, et al. developed a child eating behavior questionnaire to assess eating habits, food interests, emotional adjustment, compulsive behaviors, and eating environment for children aged 1–3 years old, which includes not only children’s eating but also caregivers’ feeding. The Eating Behavior Scale for Preschoolers developed by Yang Hsien-Jun was used to assess the eating behaviors of children aged 3–6 years, but the scale requires parental assessment to obtain research data and is not applicable to school-age children [30, 31, 24]. The scale has good reliability and validity and provides a valid tool for assessing the eating behaviors of school-age children. However, due to the large age range of school-age children and the limited sample, the scale needs to be further tested and revised.

Current status of research on responsive feeding and eating behaviors
Research on responsive feeding and eating behaviors has focused on Europe and the United States, with a primary focus on addressing and preventing the growing problem of childhood obesity. There is a correlation between parents’ levels of responsive feeding and children’s weight and eating behaviors [28]. Unhealthy eating habits will begin in the first six months of life [32]. Parental responses to early hunger and satiety signals during breastfeeding can influence the development of healthy eating habits and possibly the onset of obesity later in life [32]. Therefore, in recent years, scholars at home and abroad have begun to suggest that responsive feeding efforts should focus primarily on the promotion of breastfeeding. In addition, studies have found that as infants and toddlers age, their verbal and emotional expression and interaction skills improve, and their primary caregivers’ responsive feeding behavior scores tend to increase [33]. Eating behavior problems in infants and toddlers were most notable for “poor eating habits,” and children whose parents fed them in a forced or punitive manner were more likely to have eating behavior problems, and restricting the frequency and quantity of meals and forcing control of food types were associated with poor eating behaviors such as over-responsiveness, slow eating, and emotional eating. There is a positive association between responsive and balanced feeding behaviors by practicing positive feeding interactions and good eating behaviors by infants and toddlers [34]. Studies have shown that effective monitoring of high-calorie, unhealthy foods by mothers reduces picky eating behaviors in preschoolers, promotes feeding interactions between mothers and children, and allows mothers to adjust feeding strategies by understanding the actual needs of children [35]. However, most of the studies on children’s responsive feeding and eating behaviors in China have focused on preschool and school-age children, and not many studies have been conducted on the responsive feeding and eating behaviors of preterm and breastfeeding children, and most of them have been analyzed by using entry scales. Although policies related to enhancing responsive feeding behaviors in children have been introduced both domestically and internationally, relatively few intervention studies have been conducted to improve responsive feeding. Foreign intervention studies have intervened from the breastfeeding stage, i.e., the mother’s responsiveness to infant feeding behavior during infancy can enhance mother-infant physical contact and achieve quality proximal care [34]. Caregivers should instruct parents on how to use signs of satiety rather than prescribed milk amounts to decide when to discontinue feeding breastfeeding and formula-feeding their infants. Mothers should learn to recognize the relevant hunger and satiety signals made by their children during feeding. School-age children can be formed into a suitable feeding environment through active prep work to promote signals and interrelationships with the child [35]. Our interventions for responsive feeding have focused on preschool and school-age children, and there is a lack of research on interventions beginning at the breastfeeding stage.

Summary
In conclusion, responsive feeding reflects the two-way interactive relationship between children and caregivers, promotes the establishment of an attachment relationship between caregivers and children, makes them pay more and more attention to the internal signals of hunger and satiety, and eats in a responsive way to avoid obesity or overweight, and promotes the development of psychosocial, cognitive and language abilities. Positive and responsive feeding behaviors should be implemented in China to promote the healthy development of children’s dietary behavior. However, there are few studies on the relationship between responsive feeding and dietary behavior in China, and most of them are questionnaires and foreign scales, which may cause results bias caused by cultural differences. It is necessary to further explore the relevant scales suitable for domestic culture and carry out intervention studies to further verify the effect of responsive feeding on children’s feeding behavior and eating behavior.

References


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