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Research report

Longitudinal relations between observed parenting behaviors and dietary quality of meals from ages 2 to 5 ☆

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ABSTRACT

Objectives: Parents influence a child's diet by modeling food choices, selecting the food they will make available, and controlling the child's intake. Few studies have examined the covariation between parent's behavior management practices and their guidance and support for a young child's nutritional environment in early childhood. We hypothesized that parents' positive behavior support (PBS), characterized as skillful behavior management and proactive structuring of children's activities, would predict dietary quality over the course of early childhood (age 2 to 5 years), a critical period for the development of a dietary lifestyle through the lifespan. Methods: Participants included 731 culturally diverse, low-income families in a randomized, controlled trial of the Family Check-Up. Families participated in a yearly home visit videotaped assessment when children were 2 to 5 years. PBS and dietary quality of meals parents served to their children were assessed by coding videotapes of structured parent–child interactions, including a meal preparation task. A cross-lagged panel model was used to evaluate the longitudinal relation between PBS and the dietary quality of meals served during the meal preparation task. Results: Analyses revealed that PBS repeatedly predicted meals' dietary quality the following year: age 2–3 ($\beta = .30$), age 3–4 ($\beta = 0.14$), age 4–5 ($\beta = 0.37$). Dietary quality significantly predicted PBS 1 year later: age 3–4 ($\beta = 0.16$), age 4–5 ($\beta = 0.14$). As expected, the relative strength of the relationship from PBS to dietary quality was significantly stronger than the reverse, from dietary quality to PBS. Conclusions: Positive behavior management and proactive parenting practices are an important foundation for establishing a healthy nutritional environment for young children. These findings suggest that family-centered prevention interventions for pediatric obesity may benefit from targeting PBS in service of promoting better dietary quality.

Introduction

Pediatric obesity is a significant public health concern because of its high prevalence and serious long-term physical and psychological consequences (National Center for Health Statistics, 2012). It is well established that dietary practices and physical activity significantly influence the risk of obesity across the lifespan (Spruijt-Metz, 2011). Pediatric obesity and eating behaviors can best be understood within an ecological framework in which child characteristics interact with the environment and affect health outcomes (Davison & Birch, 2001). The family, particularly the parents or other primary caregivers, may influence diet and food preference by modeling and controlling the portion sizes and dietary quality of the food they make available to their children (Davison & Birch, 2001; Fisher, 2007). Further, children become more familiar with and more likely

Abbreviations: COIMP, Coder Impressions Inventory; FCU, Family Check-Up; PBS, positive behavior support; RPC, Relationship Process Code; WIC, Women, Infants, and Children Nutrition Program.

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to consume the food items to which they are exposed (Hill, 2002; Ventura & Birch, 2008). Other parenting practices that influence children's diets and weight status include prompting children to eat, restricting access to food, and using dessert as reward for eating more healthy foods, such as fruits, vegetables, and dairy (Rhee, 2008; US Department of Health and Human Services, 2000). Perhaps a less evident way that parents influence their child's diet is through fundamental parenting practices not specific to diet and eating behaviors (Kitzmann & Beech, 2011; Rhee, 2008). To identify ways to help parents provide their children with more healthy dietary options, and thus aid in obesity prevention efforts, it would therefore be logical to examine parenting factors that contribute to parents' efforts to present healthy and nutritious food options to their children.

Empirical studies have linked parenting styles and parenting skills to children's diet and exercise and thus on children's weight status (Rhee, 2008). Rhee (2008) provided a conceptual model that highlights the role of positive parenting behaviors on children's healthy diets through the establishment of a healthy home environment (i.e., making healthy food available, modeling healthy dietary habits). In Rhee's model, family interactions and parenting behaviors are postulated to affect children's eating behaviors, diet, and physical activity, which in turn are hypothesized to influence the child's weight status. Planning family meals, making healthy food options available, and encouraging the family to eat healthy and stay active (e.g., watch less television) requires organization and planning, appropriate monitoring from parents, and effective management of the family's daily routines and child behavior; thus, children from families with less than optimal parenting behaviors may be at higher risk for obesity. Further, parents in such families may find it especially challenging to manage children's preferences for food of low nutritional quality. Therefore, interventions that target only nutrition and diet in early childhood may be less effective than those that also target specific parenting skills.

The key to successful family-centered interventions is the identification of specific parenting practices that are modifiable (Dishion & Patterson, 1999). Unfortunately, the majority of studies have examined the diets of families with young children with measures that tap only the global parenting *styles* (e.g., authoritative, authoritarian, permissive) rather than specific parenting behaviors. Findings that have related parenting styles to dietary practices are inconsistent. Although some studies have found that authoritative parenting, characterized by high levels of warmth and behavioral control and by open communication (Baumrind, 1971), is associated with availability and higher consumption of fruits and vegetables by children (Blissett, 2011; Kremers, Brug, de Vries, & Engels, 2003), other studies have found nonsignificant relations (Vereecken, Rovner, & Maes, 2010). No longitudinal studies have linked parenting behaviors to dietary practices, and no intervention studies have shown that changes in discrete parenting strategies are related to changes in dietary practices (Ventura & Birch, 2008).

To this end, we examined the reciprocal relation between positive behavior support (PBS) and dietary quality of the meals served to children. PBS is a key and observable parenting behavior found to be significantly prognostic of early conduct problems (Dishion et al., 2008) and self-regulation skills (Lunkenheimer et al., 2008). There is a growing consensus in education, counseling and psychology that PBS is an effective and easily disseminated set of behavior management practices for schools and families (Carr et al., 1999; Dishion et al., 2008; Sugai & Horner, 2006). PBS emphasizes the use of nonaversive, reinforcing caregiver–child interactions and involves the caregiver being proactive and structuring children's activities in ways that reduce opportunities for problem behavior, as well as promote children's motivation for self-regulation (Lunkenheimer et al., 2008). One of the key principles of PBS is prompting and reinforcing children's positive behavior, and therefore, it is optimally measured using direct observations of caregivers' use of positive reinforcement strategies, stating clear expectations for positive behaviors, positively engaging with the child, and structuring the child's environment to provide a context for healthy development. Previous research with the study sample has indicated that participating in the Family Check-Up (FCU; Dishion & Stormshak, 2007), an evidence-based parenting intervention, leads to improvements in parents' use of PBS in toddlerhood, which in turn is related to reduced problem behavior 2 to 5 years later (Dishion et al., 2008; Lunkenheimer et al., 2008).

Recently we found positive intervention effects of the FCU on dietary quality of meals and reduced growth in body mass index (BMI) from age 5 to 9 (Smith, Montaño, Dishion, Shaw, & Wilson, 2014). This finding is consistent with other early prevention work focusing on parenting practices to have collateral benefits on growth in childhood obesity (Brotman et al., 2012). Although promising, this research would benefit from studies examining how parenting practices such as PBS and dietary quality are linked over time and the extent to which PBS is a skill set that is also relevant to parents' practice of offering healthy meals and ability to manage children's preferences for healthy foods. A developmental process model of the links between parents' preparation of healthy meals and PBS provides an empirical basis for the design and refinement of intervention programs for the prevention of pediatric obesity.

In this study we used a cross-lag panel model to evaluate the longitudinal relationship between PBS and dietary quality of meals served to children from ages 2 to 5. It was hypothesized that higher levels of PBS would be prospectively related to better dietary quality of meals served to children. In the case that better dietary quality was prospectively related to higher levels of PBS, we hypothesized that the relative strength from PBS to dietary quality would be stronger than the opposite direction. Because children from families of lower socioeconomic status are at higher risk for obesity (Ogden, Carroll, Kit, & Flegal, 2014), we tested intervention condition, child gender, and family poverty status, assessed at age 2, as moderators of the relation between PBS and dietary quality over time to ensure generalizability. We did not hypothesize that the model would differ for any of the tested moderating variables.

Materials and methods

This study included 731 families (49% female children) in a randomized, controlled trial who were recruited from Women, Infants, and Children Nutrition Program (WIC) sites in three geographically and culturally diverse U.S. regions near Charlottesville, Virginia; Eugene, Oregon; and Pittsburgh, Pennsylvania. Families with children between ages 2 years 0 months and 2 years 11 months who indicated risk on 2 out of 3 screening measures for socioeconomic, family, and child factors were invited to participate in the study. The most predominantly represented caregiver participants were biological mothers (>90% at each age), and each caregiver–child dyad engaged in a yearly assessment. The sample is culturally diverse and includes European American (50.1%), African American (27.9%), Latino/Hispanic (13.4%), and American Indian, Asian American, Native Hawaiian, and multiple ethnicities (8.6%). The institutional review boards of the Universities of Oregon, Pittsburgh, and Virginia approved this research. Germane to the current study, the weight status of the children in the sample at age 5, based on the World Health Organization growth reference data for children ages 5 to 19 years (Onis et al., 2007), had the following distribution: underweight (2.7%), normal weight (62.0%), at risk for overweight (9.4%), at greater risk for overweight (8.9%), overweight (16.9%). In 2011–2012, 8.4% of children ages 2–5 and 17.7% of children ages 6–11 in the United States were obese (Ogden et al., 2014).

Following the first assessment at age 2, 367 families were randomly assigned to the intervention condition (FCU) and 364 were assigned to a WIC services as usual condition. The FCU consists of

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