Appetite 100 (2016) 181–188

Contents lists available at ScienceDirect

Appetite

journal homepage: www.elsevier.com/locate/appet

Parental control and overconsumption of snack foods in overweight and obese children

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ARTICLE INFO

Article history:
Received 8 December 2015
Received in revised form
12 February 2016
Accepted 15 February 2016
Available online 18 February 2016

Keywords:
Childhood obesity
Overeating
Parent feeding practices

ABSTRACT

The associations between snack food consumption, parent feeding practices and general parenting in overweight in obese children are largely unknown. Therefore, we examined these relationships in 117 treatment-seeking overweight and obese children (10.40 ± 1.35 years; 53% female; 52% Caucasian; BMI-z: 2.06 ± .39). Children consumed a dinner meal, completed an Eating in the Absence of Hunger (EAH) free access paradigm (total EAH intake = EAH%-total; sweet food intake = EAH%-sweet), and completed the Child Report of Parent Behavior Inventory. Parents completed the Child Feeding Questionnaire. Child EAH%-total and EAH%-sweet were positively associated with dinner consumption (p's < .01). Girls had significantly higher EAH%-total compared to boys (p < .05). In separate models, higher EAH%-total was associated with greater use of maternal psychological control (p < .05) and EAH%-sweet was positively associated with parent monitoring (p < .05). In analyses examining factors associated with the consumption of specific foods, EAH snack food, parent restriction, pressure to eat, monitoring, and maternal psychological control were positively correlated with intake of Hershey's® chocolate bars (p's < .05). In summary, parental monitoring is associated with child sweet snack food intake and maternal psychological control is associated with child total snack food consumption. Future research should evaluate the complex relationship between child eating and parenting, especially with regard to subgroups of foods.

1. Introduction

Childhood overweight and obesity affects approximately one-third of all children in the United States, impacting an estimated nine million children (Ogden, Carroll, Kit, & Flegal, 2014). Unfortunately, child eating behaviors and weight status have been shown to remain consistent well into adulthood (Craigie, Lake, Kelly, Adamson, & Mathers, 2011; Singh, Mulder, Twisk, van Mechelen, & Chinapaw, 2008). Although children who are overweight are often assumed to be a homogeneous group, there is a growing interest in defining behavioral phenotypes to ultimately explore etiological mechanisms and to develop targeted treatments (Boutelle et al., 2014; Field, Camargo, & Ogino, 2013). Excessive intake of highly palatable calorie dense foods is one of the most proximal causes of rising obesity rates during the past three decades (Swinburn et al., 2009). The current obesogenic environment, which provides continuous access to highly palatable foods in combination with limited physical activity options, may promote overeating especially among children that experience higher levels of food cue responsivity or have a tendency to engage in disinhibited eating behaviors. Thus, it is crucial to identify the factors that contribute to overeating in children in order to better determine mechanisms to target in prevention and treatment interventions.

Eating in the absence of hunger (EAH), a measure of disinhibited eating, has been implicated in the behavioral etiological pathway of obesity in children (Birch, Fisher, & Davison, 2003a; Faith et al., 2006). EAH is typically measured using a laboratory paradigm

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http://dx.doi.org/10.1016/j.appet.2016.02.030
0195-6663/

that evaluates the amount of food consumed during a free access snack session after a meal (Birch, Fisher, & Davison, 2003b). Studies using the EAH paradigm have shown that EAH was positively related to girls' weight-for-height (Cutting, Fisher, Grimm-Thomas, & Birch, 1999) and overweight status among five and seven year old girls, even after adjusting for sex and age-based intake requirements (Fisher & Birch, 2002). In a Hispanic-only sample of 5–18 year olds, overweight children consumed 6.5% more calories during the EAH paradigm than non-overweight children (Fisher, Cai, et al., 2007a; Fisher, Liu, Birch, & Rolls, 2007b). When comparing intake across discordant weight siblings, older overweight and obese siblings consumed more calories in an EAH paradigm compared to both older and younger normal weight siblings (Kral et al., 2012). Finally, longitudinal studies of overweight girls have found that EAH increased over eight years regardless of weight-status (Francis, Ventura, Marini, & Birch, 2007); in addition, greater increases in EAH were observed two (Fisher & Birch, 2002) and four years later (Shunk & Birch, 2004) in longitudinal studies of overweight five-year-old girls. Conversely, some studies have found no significant relationships between EAH and weight gain over a one-year time period after controlling for baseline weight, age, sex, and pubertal status (Butte et al., 2007). For example, several studies with 7–12 year old children (Moens & Braet, 2007) found that increased weight was associated with decreased EAH food consumption. It was speculated that high social desirability, particularly among girls, may explain this inverse relationship (Hill et al., 2008). Given the lack of agreement in studies regarding the relationship between weight and EAH intake (Butte et al., 2007; Hill et al., 2008; Moens & Braet, 2007), and that not all overweight children universally display this behavior (Hill et al., 2008; Sonneville et al., 2013), EAH may represent a unique disinhibited eating behavior within the heterogeneous obese population.

Some limitations in the current cross-sectional and longitudinal studies may explain the mixed findings regarding the association between EAH and weight. For instance, not all studies estimated energy intake equations to calculate energy consumed based on age and sex during the EAH snack paradigm (Fisher & Birch, 2002; Fisher, Liu, et al., 2007b; Kral et al., 2012; Shunk & Birch, 2004). Furthermore, the majority of studies have evaluated EAH across weight status, including both normal weight and overweight children (Birch et al., 2003b; Butte et al., 2007; Faith et al., 2006; Fisher & Birch, 2002; Fisher, Cai, et al., 2007a; Fisher, Liu, et al., 2007b; Spruijt-Metz, Lindquist, Birch, Fisher, & Goran, 2002). Cross-sectional studies that compare overweight and normal weight groups are valuable for illustrating general characteristic differences between these populations, but these studies do not specifically describe the EAH phenotype that may be more pronounced in overweight children. Better understanding this phenotype could help produce more targeted interventions for overweight children.

Parents play a critical role in the development of eating behaviors in children and could be associated with aberrant eating behaviors, such as EAH. Parent feeding practices, such as controlling feeding practices, restriction, and pressure to eat, are common approaches used by parents in an attempt to encourage children to consume a healthy diet (Faith, Scanlon, Birch, Francis, & Sherry, 2004). However, these feeding practices may not be effective in promoting healthy eating behaviors in children (Savage, Fisher, & Birch, 2007). Moreover, controlling food intake, instead of allowing children to respond to their own internal cues of hunger and satiety, may disrupt the child's ability to self-regulate and could lead to disinhibited eating (Rollins, Savage, Fisher, & Birch, 2015). For example, pressuring a child to eat and encouraging a child to eat beyond satiety are feeding practices that are positively associated with overeating in young children (Birch et al., 2003b; Faith et al., 2004; Fisher & Birch, 2002; Kral & Faith, 2008; Remy, Issanchou, Chabanet, Boggio, & Nicklaus, 2015). In a longitudinal study of five year old girls, the use of restrictive feeding practices predicted EAH two years later, even after controlling for Body Mass Index (BMI) and baseline EAH intake (Fisher & Birch, 2002). Another study found that restrictive feeding practices among overweight mothers of five-year-old girls predicted EAH four years later (Francis & Birch, 2005). Other feeding practices such as using food to regulate emotions are also related to increased child consumption of sweet foods in the absence of hunger (Blissett, Haycraft, & Farrow, 2010). These studies suggest the unintentional impact of parent feeding practices on the development of a potentially maladaptive eating behavior.

However, specific parent feeding practices do not act alone and exist within the broader context of general parenting style. It is possible that general parenting style affects child eating behavior via parent feeding practices. General parenting style includes higher-order constructs that contribute to the socio-emotional context of the parent–child interaction (K. Rhee, 2008), and provide a framework for which children interpret the specific parenting practices that parents implement (K. Rhee, 2008). General parenting style, often defined by varying levels of warmth, support, and behavioral and psychological control (Schludermann & Schludermann, 1988), has been associated with child food intake in cross-sectional studies and may promote or maintain maladaptive eating behaviors (Rodenburg, Oenema, Kremers, & van de Mheen, 2012; van der Horst et al., 2007). Cross-sectional studies suggest that an authoritative parenting style, compared to authoritarian parenting style, was associated with lower adolescent caloric intake when combined with limitations on sugar sweetened beverages (van der Horst et al., 2007). In another study, parenting characterized by high levels of warmth and support with clear communication and appropriate boundary-setting has been associated with greater fruit and vegetable intake (Kremers, Brug, de Vries, & Engels, 2003; Schmitz et al., 2002). Firm maternal parenting has also been associated with decreased snacking in overweight children (K. E. Rhee et al., 2015). Conversely, high parental psychological control (control of child's behavior through psychological means such as love withdrawal and guilt induction), combined with low support and low behavioral control, has been correlated with lower fruit consumption in children (Rodenburg et al., 2012). Although these studies suggest that general parenting style may influence child overeating, there is no available research exploring the relationship between general parenting style and aberrant eating behaviors, such as EAH. Given the crucial role that parents play in facilitating healthy eating behaviors and weight change, it is important to examine the unique contribution of both parent feeding practices and general parenting with child EAH.

EAH is measured using a laboratory paradigm, in which the child is fed a meal until full, and then is given free access to a variety of foods. These foods range from sweet and salty snack foods to buffet foods, and very little attention has been paid to overconsumption of specific types of foods in the EAH paradigm. Combining all foods consumed in the EAH is based on the assumption that eating behavior is the same across foods. However, sweet foods may contribute more to overeating as sweet taste preferences are influenced by innate biology and learned experiences (Conner, Haddon, Pickering, & Booth, 1988; Ventura & Mennella, 2011; Drewnowski, Mennella, Johnson, & Bellisle, 2012). Although there is much controversy as to the role of sweet foods in the development of obesity (Benton, 2010), sugar in particular has been studied as a contributor to food addiction, referencing a specific uncontrollable drive to eat sugar (Avena, Rada, & Hoebel, 2008). Foods high in sugar may contribute to overeating through hormonal and