



## Research report

Parental feeding styles and adolescents' healthy eating habits. Structure and correlates of a Costa Rican questionnaire<sup>☆</sup>

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## ABSTRACT

This study designed and validated a questionnaire aimed at examining parental feeding styles to encourage healthy eating habits among Costa Rican adolescents. Adolescents ( $n = 133$ ; mean age 15.4 years), and their parents, participated in the study. The parents completed a parental feeding style questionnaire, and the adolescents completed 3-day food records. Confirmatory factor analyses suggest four distinct parental feeding styles, (a) verbal encouragement of healthy eating behaviors; (b) use of verbal sanctions to indirectly control the intake of healthy food; (c) direct control of access to and intake of food; and (d) use of food to regulate emotions and behavior. There were no correlations between dietary intake and the verbal encouragement of healthy eating behaviors, but there were significant negative correlations between (1) “the use of verbal sanctions to indirectly control the intake of healthy food”, and the consumption of fruit and vegetable, of calcium, iron, vitamin B6 and folic acid intake, and (2) between the “direct control of access to and intake of food” and fast food consumption and total carbohydrates intake. The use of food to regulate emotions and behavior was positively correlated with high energy-dense food consumption. Stratification of the data shows significant differences by gender in the correlations between parental feeding style and dietary intake. Understanding parental feeding styles in a Latin American context is a first step in helping researchers develop culturally-appropriate parenting intervention/prevention strategies to encourage healthy eating behaviors during adolescence.

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## Introduction

Research has shown that healthy eating habits developed during adolescence may help teenagers achieve their full growth potential and may pose beneficial health effects throughout life (Lytle, 2002). However, adolescent eating habits are usually inconsistent with healthy eating recommendations, as intakes of saturated and trans fatty acids, as well as sucrose, are high compared to noticeably low intakes of some vitamins, minerals, fiber, fruits, and vegetables (Monge-Rojas, 2001a; Monge-Rojas, 2001b; Muñoz, Krebs-Smith, Ballard-Barbash, & Cleveland, 1997).

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Parental feeding styles have been shown in some countries to help mold eating habits during adolescent years (da Veiga & Sichieri, 2006; de Bourdeaudhuij, 2008; Guilano-Ramos et al., 2007).

A better understanding of the parental feeding styles in a Latin American context might help researchers develop culturally-appropriate parenting intervention/prevention strategies to encourage healthy eating behaviors during adolescence.

Based on social cognitive theory and an ecological perspective, Story and colleagues (Story, Neumark-Sztainer, & French, 2002) have proposed a conceptual model that portrays adolescent eating habits as the result of multiple levels of influence that interact in complex and changing ways. Parents can be a major influence on adolescent food habits as they shape their children's eating environment as providers, models and regulators (Birch & Fisher, 1998; Jenkins & Horner, 2005; Salvy, Vartanian, Coelho, Jarrin, & Pliner, 2008; Savage, Fisher, & Birch, 2007; Story et al., 2002). The influence of parental feeding style on adolescent eating is often conceptualized as a system based on the quality of the parent-child relationship and with dynamically-interrelated dimensions

that include, monitoring (e.g., attention and tracking), behavior management (e.g., negotiation), and social cognitions (e.g., motivation and norms) (Borawski, Ievers-Landis, Lovergreen, & Trapl, 2003).

Parental feeding styles seem to influence each gender differently, possibly as a consequence of different health beliefs, attitudes, food choices, weight concerns, and eating behaviors between boys and girls (Arredondo et al., 2006; Fisher, Mitchell, Smicklas-Wright, & Birch, 2002; Snoek, Engels, Janssens, & van Strein, 2007). Some studies, though not all (Snoek, Engels, et al., 2007), suggest that, among boys, adolescent emotional eating is associated with a significant increase in frequency of fruit and vegetable intake (Nguyen-Mitchell, Unger, & Spruijt-Metz, 2007). On the contrary, other studies, but not all (Snoek, Van Strein, Janssens, & Engels, 2007), have linked emotional eating with a greater risk for developing unhealthy dietary patterns and obesity during adolescence due the overconsumption of energy-dense foods (Nguyen-Mitchell et al., 2007; Steinegger, 2005). Compared to boys, it has been suggested that girls eat more unhealthy foods (i.e. foods that are high in sugar and, fat) when their parents engage in a controlling parenting style regarding their eating (Arredondo et al., 2006; Birch & Fisher, 1998; McCourt & Waller, 1995).

The direction of the association between parental feeding styles and adolescent eating behaviors is still somewhat unclear. Some (de Bourdeaudhuij, 1997; de Bourdeaudhuij & van Oost, 2000; Haerens et al., 2007; Videon & Manning, 2003; Zabinski et al., 2006), but not all (MacFarlane, Crawford, Ball, Savige, & Worsley, 2007) studies have shown that adolescents who report more food rules in the family or perceive more restrictive parenting practices, have a healthier diet and consume less soft drinks and other sugar-sweetened beverages. Similarly, other studies have suggested that adolescents who eat with familial co-eaters have better food regulation and selection than those who eat alone or with strangers (Salvy et al., 2008). It is important to note that most studies have been conducted in European countries and in the United States. Because socio-cultural norms and customs may influence parental attitudes toward child rearing, including feeding, as well as adolescent attitudes towards their parents (World Health Organization, 1999), studying this influence in Latin American countries may reveal yet different levels of impact of parental feeding on adolescent eating behaviors.

The “Parental feeding styles and adolescents’ healthy eating habits. Structure and correlates of a Costa Rican questionnaire” intends to evaluate the influence of parental feeding styles on eating behaviors among Costa Rican adolescents. In this manuscript, the authors present the design, validation and four distinct feeding styles that emerged from this questionnaire, aimed to identify the potential styles of parental influence on the promotion of healthy eating habits among their adolescents. In addition, the authors examined correlates of the questionnaire with adolescent socioeconomic variables, the consumption of selected foods groups and the intake of several nutrients.

## Methods

### *Study sample*

The study sample was comprised of 133 urban and rural Costa Rican adolescents, aged 14–18 years old, of mestizo background (mixed Spanish and indigenous people). Adolescents were recruited from eight public high schools (five urban and three rural) in San José, Costa Rica. The schools were chosen from a list of all the public high schools in the capital city of San José, using a proportional-size probability formula (Everitt, 2003) Adolescents’ parents responsible for the access to and intake of food of the adolescent children at home were also invited to participate in the study.

Adolescents’ parents gave their written consent and the adolescents their assent to participate in the study according to the rules provided by the Bioethics Committee of the Costa Rican Institute for Research and Education on Nutrition and Health (INCIENSA).

### *Ethical procedure*

The Costa Rican Institute for Research and Education on Nutrition and Health (INCIENSA) Ethics Committee granted permission for the study. Written parental consent and adolescent assent was required to participate in the study. The only compensation given to adolescents was a lecture on healthy lifestyle presented at each school at the end of the data collection. Information and educational materials about healthy lifestyle were provided at each of these lectures.

### *Socio-demographic information*

The survey included 12 socio-demographic items, age, gender, area, father’s and mother’s educational level (years of formal education), home ownership, consumption of services and ownership of household appliances and services such as Internet, cable TV, hot water system, microwaves and others. Ownership of goods was used to determine an indicator of socioeconomic status according to the methodology described elsewhere by Madrigal (1998).

### *Anthropometric measurements*

Height and weight measurements were obtained according to the guidelines established by Lohman, Roche, and Martorell (1988). Weight was measured without shoes or heavy outer clothing. Height was measured without shoes while the students faced away from the scale. Standing height was measured to the nearest 0.1 cm and weight was measured to the nearest 0.1 kg. Independent duplicate measurements were obtained for height and weight, and the average of both readings – required to be within  $\pm 0.5$  cm or 0.5 kg respectively – was used in data analyses. Measurements out of these ranges were not used in data analyses.

Body Mass Index (BMI), was calculated as weight (kg) divided by height (m) squared. Adolescents with BMI at or above the sex-specific 85th percentile were considered to be overweight as suggested by the World Health Organization (WHO Expert Committee on Physical Status, 1995).

### *Dietary assessment*

Dietary intake was determined using 3-day food records (Willet, 1998). The 3 days included one weekend day and the next day or previous two weekdays (Sunday, Monday and Tuesday or Thursday, Friday and Saturday). The adolescents used a series of photographs of foods usually consumed in Costa Rica to estimate portion size while keeping the food record (Chinnock, 2006). Three trained nutritionists used food models and fresh foods to verify serving size of some portions reported by the adolescents.

Nutrient intake was calculated using the Food Processor<sup>®</sup> for Windows version 6.0 (Esha Research, Salem, Oregon), which was modified to include the nutritional value of 60 food preparations commonly consumed in Costa Rica. Dietary intakes were adjusted for total energy intake by regressing the transformed variable on total energy intake as described elsewhere by Willet (1998).

### *Parental feeding style questionnaire*

A first version of the parental feeding style questionnaire was developed considering parental styles proposed by previous

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