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Research report

Association between Australian-Indian mothers' controlling feeding practices and children's appetite traits ☆

Rati Jani [a], Kimberley M. Mallan [a,*], Lynne Daniels [b]

[a] The Institute of Health & Biomedical Innovation, Queensland University of Technology, Brisbane, Australia
[b] School of Exercise & Nutrition Sciences, Queensland University of Technology, Brisbane, Australia

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ABSTRACT

This cross-sectional study examined the association between controlling feeding practices and children's appetite traits. The secondary aim studied the relationship between controlling feeding practices and two proxy indicators of diet quality. Participants were 203 Australian-Indian mothers with children aged 1–5 years. Controlling feeding practices (pressure to eat, restriction, monitoring) and children's appetite traits (*food approach traits:* food responsiveness, enjoyment of food, desire to drink, emotional overeating; *food avoidance traits:* satiety responsiveness, slowness in eating, fussiness and emotional undereating) were measured using self-reported, previously validated scales/questionnaires. Children's daily frequency of consumption of core and non-core foods was estimated using a 49-item list of foods eaten (yes/no) in the previous 24 hours as an indicator of diet quality. Higher pressure to eat was associated with higher scores for satiety responsiveness, slowness in eating, fussiness and lower score for enjoyment of food. Higher restriction was related to higher scores for food responsiveness and emotional overeating. Higher monitoring was inversely associated with fussiness, slowness in eating, food responsiveness and emotional overeating and positively associated with enjoyment of food. Pressure to eat and monitoring were related to lower number of core and non-core foods consumed in the previous 24 hours, respectively. All associations remained significant after adjusting for maternal and child covariates (n = 152 due to missing data). In conclusion, pressure to eat was associated with higher food avoidance traits and lower consumption of core foods. Restrictive feeding practices were associated with higher food approach traits. In contrast, monitoring practices were related to lower food avoidance and food approach traits and lower non-core food consumption.

Introduction

Childhood obesity is a complex global public health challenge, with both genetic and environmental determinants including ready availability and affordability of nutrient-poor, energy-dense (i.e. 'non-core') foods (Santos et al., 2011). It is widely agreed that prevention and hence interventions to modify the environmental determinants of childhood obesity are critical. Mothers are typically the primary "gatekeepers" of young children's food environment (Webber, Cooke, Hill, & Wardle, 2010). Therefore, the feeding practices mothers use to regulate the quality and quantity of food consumed by their children have received considerable attention over the last 10 years. Particularly, mothers' use of 'controlling' feeding practices (restriction, pressure to eat and monitoring) have been extensively examined due to theoretical and empirical links with the child's weight status (Ventura & Birch, 2008). In a prospective study (n = 57), restriction at 5 years was associated with higher weight gain between 5 and 7 years, and pressure to eat and monitoring were associated with lower BMI z-scores at age 7, after controlling for baseline weight status (Faith et al., 2004). It has been postulated that the association between maternal feeding practices and the child's weight status may partly be explained (mediated) by child-related variables including eating behaviours (appetite traits) and diet quality (Ventura & Birch, 2008; Webber et al., 2010; Webber, Hill, Saxton, Van-Jaarsveld, & Wardle, 2009).

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* Corresponding author.
E-mail address: kimberley.mallan@qut.edu.au (K.M. Mallan).

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The Children's Eating Behaviour Questionnaire (CEBQ) (Wardle, Guthrie, Sanderson, & Rapoport, 2001) is a psychometric tool widely used to assess multiple dimensions of children's eating behaviour. The CEBQ was developed in the UK with children aged 2–7 years, and has been validated in culturally diverse populations such as Portuguese (3–13 years) (Viana, Sinde, & Saxton, 2008), Chilean (6–12 years) (Santos et al., 2011), and Chinese and Indian migrants residing in Australia (1–5 years) (Mallan et al., 2013). Eating behaviours in children are broadly conceptualised as traits indicative of *greater appetite* or *approach* towards eating (food approach traits: food responsiveness, desire to drink, enjoyment of food, emotional overeating) and eating behaviour traits reflecting *poor appetite* or *avoidance* of eating (food avoidance traits: satiety responsiveness, slowness in eating, fussiness, emotional undereating) (Webber et al., 2009, 2010). Food approach traits are postulated to reflect increased responsiveness to external food cues, and therefore increase childhood obesity risk (Parkinson, Drewett, Le-Couteur, & Adamson, 2010). In contrast, food avoidance traits may reflect an overall poor interest in food and eating (Gregory, Paxton, & Brozovic, 2010a), which, in turn has been associated with lower child weight status (Parkinson et al., 2010). In 418 British children, food approach traits (emotional overeating and desire to drink) and food avoidance traits (satiety responsiveness) at age 5–6 years were prospectively associated with higher and lower BMI at age 6–8 years, respectively after controlling for child age, gender and birth weight (children's weight at 5–6 years was not measured) (Parkinson et al., 2010).

It is important to acknowledge that children's appetite traits have a heritable component (Webber et al., 2009, 2010) and mealtime interactions between mother and child are likely to be bidirectional in nature (Ventura & Birch, 2008). Therefore, maternal feeding practices may be both a reaction to (dependent variable) as well as an influence on (independent variable) children's appetite traits and diet quality (Ventura & Birch, 2008). However, modifying the mothers feeding techniques rather than child-related variables (appetite traits and diet quality) is likely to be a more pragmatic approach. Previous research, predominantly cross-sectional, has examined the relationship between maternal feeding practices and children's appetite traits, and diet quality. Higher restriction of non-core foods (e.g. cookies) has been related to higher food approach traits (e.g. food responsiveness), and higher pressure to eat core foods (e.g. vegetables) has been correlated with higher food avoidance traits (e.g. fussiness) in children (2–9 years) (Farrow, Galloway, & Fraser, 2009; Gregory et al., 2010a; McPhie et al., 2011; Webber et al., 2010). In contrast, to the numerous studies examining the relationship between restriction/pressure to eat and children's appetite traits, few studies exploring the relationships between maternal monitoring of non-core food intake and appetite traits of children (2–6 years) have reported no association (Farrow et al., 2009; McPhie et al., 2011).

There is evidence predominately from cross-sectional studies to suggest that specific controlling feeding practices may have repercussions for children's diet quality. In an experimental study, restriction of non-core foods was associated with higher consumption of the restricted food items even in the absence of hunger in American children (n = 197) aged 5 years (Fisher & Birch, 2002). Pressure to eat core foods such as vegetables by American mothers (n = 192) has been cross-sectionally correlated with their 5 year old children's lower consumption of that food (Fisher, Mitchell, Smiciklas-Wright, & Birch, 2002). In contrast, monitoring children's non-core food intake, which is a relatively indirect (i.e. cannot easily be perceived by the young child) controlling feeding practice relative to restriction and pressure to eat has been cross-sectionally associated with higher intake of core foods such as vegetables and lower intake of sweet and savoury non-core foods in British children (n = 434) aged 2–5 years (McGowan, Croker, Wardle, & Cooke, 2012).

Overall, the evidence suggests a relationship between maternal feeding practices and children's appetite traits and diet quality. Thus, it is conceivable that interventions that target maternal feeding practices may impact favourably on child-related variables (appetite traits and diet quality), thereby reducing children's risk of excess energy intake and excess weight gain in the longer term (Daniels et al., 2009; Wen et al., 2007). The CEBQ has been validated and its relationship with children's weight status has been explored in a number of culturally diverse samples (Santos et al., 2011; Viana et al., 2008). In comparison, few studies have examined the relationship between maternal feeding practices and child-related variables (appetite traits and diet quality) in culture-specific contexts. In particular, to our knowledge, no studies have examined these relationships in Indian mothers, and cross-cultural application of existing findings predominantly from Caucasian populations is unclear. In Australia, recent national data indicate that one in five children between 2 and 4 years of age is overweight or obese (Australian Bureau of Statistics, 2013). The national Australian health profile is significantly influenced by the health status of its major immigrant populations, of which Indians are the fourth largest (Australian Bureau of Statistics, 2011). Thus, examination of factors that may contribute to childhood overweight and obesity in Australian-Indians is warranted.

The study primarily aims to examine the association between Australian-Indian mothers' use of controlling feeding practices and children's appetite traits measured using the CEBQ (Wardle et al., 2001) which has been previously validated for use in the present study sample (Mallan et al., 2013). The secondary aim was to investigate the relationship between controlling feeding practices and two proxy indicators of children's diet quality, namely consumption of number of core and non-core foods.

Methods

Participants

This cross-sectional questionnaire-based study used a convenience sampling technique to recruit 230 Indian-born mothers residing in Australia for more than 1 year and less than 8 years. Details of the recruitment strategies are published elsewhere (Jani, Mallan, Mihrshahi, & Daniels, in press; Jani, Mallan, Mihrshahi, Mandalika, & Daniels, 2014a; Jani, Mihrshahi, & Mallan, 2014b). In brief, eligibility criteria were: born in India, older than 18 years of age, facility with written and spoken English, and a child aged 1–5 years perceived by mother as generally healthy. If the mother had more than one child in the age range, then she was asked to report on the youngest child only. This residence time frame was based on studies by Kannan, Carruth, and Skinner (1999, 2004) who suggested that Indian immigrant mothers living in the US for 1 to 8 years may benefit from receiving nutritional intervention in the host country regarding appropriate child feeding.

Potential participants were approached through Indian community and university associations, media networks (e.g. newspapers), places of worship (e.g. temples), retail outlets (e.g. Indian grocery stores), networks of friends and family and online social networks. The questionnaire (hardcopy and online version) was developed in English only and was piloted with 14 mothers. Completion of the questionnaire indicated informed consent. A greater proportion (77%) of the mothers completed the online version of the questionnaire. Calculating the response rate was possible only for the questionnaire hardcopies, therefore a target response (questionnaire hardcopies plus softcopies distributed and received) rate could not be calculated. The response rate via questionnaire hardcopies was 12.5% (received: 58, distributed: 463 copies).