



Factors contributing to infant overfeeding in low-income immigrant Latina mothers



Diana Cartagena, PhD, RN^{a,*}, Suzanne W. Ameringer, PhD, RN^b, Jacqueline M. McGrath, PhD, RN^c, Saba W. Masho, MD, MPH^d, Nancy Jallo, PhD, RN^b, Barbara J. Myers, PhD^e

^a School of Nursing, Hampton University, Hampton, VA, USA

^b Department of Family and Community Health Nursing, Virginia Commonwealth University, Richmond, VA, USA

^c School of Nursing, University of Connecticut, Storrs, CT, USA

^d Department of Family Medicine and Population Health, Virginia Commonwealth University, Richmond, VA, USA

^e School of Psychology, Virginia Commonwealth University, Richmond, VA, USA

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ABSTRACT

Background: Approximately 10% of U.S. infants and toddlers are considered overweight. Hispanic infants persistently show higher prevalence rates for being overweight compared to other infants. Little is known about factors promoting excessive infant weight gain in Latinos.

Purpose: The aim of this study was to describe multidimensional factors and maternal feeding practices that may correlate with infant overfeeding in Latina mothers.

Methods: Participants were 62 low-income immigrant Latina mothers and their infants. Study measures were: acculturation; maternal feeding beliefs and practices; food availability; temperament; 24-hour dietary recall; and infant's weight-for-height z score.

Results: In regression models adjusted for infant's age, healthier feeding practices were significantly predicted by maternal education and infant's age. Most mothers preferred feeding their infants either formula or a combination of breast milk and formula. A significant proportion of the infants were overweight or obese and yet some mothers displayed difficulty recognizing this problem.

Conclusion: Future intervention efforts should focus primarily on the promotion of healthy feeding practices that discourage overfeeding and support exclusive breastfeeding among this ethnic group.

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1. Introduction

An estimated 10% of U.S. infants and toddlers are considered overweight. Hispanic infants have persistently demonstrated higher obesity prevalence rates (14.8%) compared to black (8.7%) and white infants (8.4%) (Ogden, Carroll, Kit, & Flegal, 2012). Rapid weight gain during the first 2 years of life is associated with an increased risk for developing obesity in older children and adults (Nader et al., 2006; Owen, Martin, Whincup, Smith, & Cook, 2005). Adverse health consequences linked to obesity in children and adolescents include cardiovascular disease, hypertension, and type 2 diabetes (Barlow, 2007). Evidence shows that obese children as young as 3 years have inflammatory biomarkers associated with a risk for developing heart disease later in life (Skinner, Steiner, Henderson, & Perrin, 2010). According to a recent report by the Centers for Disease Control and Prevention (CDC) Centers

for Disease Control (2011), Hispanic children are 1.5 times more prone than whites to develop diabetes. Thus, obesity prevention efforts must begin early in life and be targeted to high-risk groups such as Latino infants.

Gaps remain in our understanding of the factors contributing to rapid weight gain in Latino infants. Recent review of the literature suggest that the feeding beliefs and practices of Latina mothers likely promote infant overfeeding and may explain the high infant overweight rates often seen among this ethnic group (Cartagena et al., 2014). Overfeeding was defined as “feeding behaviors that lead to an energy intake for the infant that exceeds the requirements for normal growth and development” (Cartagena et al., 2014). Higher intakes of formula and other sources of energy have shown to be positively associated with increased infant weight and childhood body mass index (BMI) (Ong, Emmett, Noble, Ness, & Dunger, 2006).

Research on breastfeeding and formula feeding beliefs, attitudes, and practices of Latina mothers highlight infant feeding differences among these mothers. Latina mothers are more likely to initiate breastfeeding but less likely to practice exclusive breastfeeding than white or black mothers (Centers for Disease Control, 2013). The most common reason given by Latinas for non-exclusive breastfeeding is concern of having an inadequate milk supply (Kaufman, Deenadayalan, &

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* Corresponding author at: School of Nursing, Hampton University, Hampton, VA 23668. Tel.: +1 757 218 3832.

E-mail address: diana.cartagena@hamptonu.edu (D. Cartagena).

Karpati, 2009). The maternal belief that a combination of breast milk and formula feeding is better for the infant also contributes to non-exclusive breastfeeding practices in Latinas (Bartick & Reyes, 2012; Bunik et al., 2006). Another factor contributing to feeding differences in Latinas is the cultural belief that a heavier baby is a healthy baby (Bunik et al., 2006; Kaufman & Karpati, 2007). Bunik et al. reported that Hispanic mothers often receive advice and pressure from family members and fathers to supplement breast milk with formula if the infants were fussy or not *gordito* (chubby).

Maternal feeding practices and the family feeding environment determine the infant's eating behaviors that have lifelong lasting health outcomes. Infancy is a critical period of growth, development milestones and plasticity. Mothers play a crucial role in molding their infants eating habits and food preferences (Anzman, Rollins, & Birch, 2010). The higher obesity rates observed in Latino infants could be linked to unhealthy feeding practices such as overfeeding. Given the already identified importance of maternal feeding practices during early childhood to the later development of obesity, the purpose of the current study was to describe maternal, infant, and food factors contributing to infant overfeeding practices of Latina mothers using an Ecological Model of Growth (EMG).

The EMG developed by Reifsnider, Gallagher, and Forgione (2005) informed the conceptual framework for exploring the complex interplay of socioeconomic and cultural influences on maternal feeding decisions and practices that may lead to obesity in Latino infants. The EMG is a heuristic model, which suggests that environmental factors can influence a child's growth (Reifsnider et al., 2005).

In this model, the factors at the host (child) and agent (food) levels interact with the environment (microsystem and mesosystem). The host variables are those characteristics of the child such as temperament. The agents of growth are the nutritional resources including food quality and quantity. The microsystem environment consists of the child's home environment and the parent–child interactions. The mesosystem environment consists of the child's community outside the home. In the adapted EMG framework the maternal, child and food factors are interrelated and placed within larger socioeconomic and cultural contextual factors. At present, not enough empiric evidence is available to uncover which factors are the strongest predictors of infant overfeeding practices among Latina mothers.

A better understanding of factors influencing Latina mothers feeding decisions and practices is of most importance to develop targeted interventions needed to promote and prevent health disparities like obesity in infancy. This study aims to examine maternal, infant, and food factors associated to the overfeeding practices of Latina mothers.

2. Methods

2.1. Study design and participants

A cross-sectional study was designed involving a convenience sample of low-income immigrant Latina mothers and their infants, aged 4–12 months ($n = 62$). Recruitment took place at the Women, Infants and Child program (WIC) offices in a group of southeastern cities. Mothers were eligible to participate if they met the following criteria: (a) immigrant Latina mothers from Central, South America, or the Caribbean; (b) 18 years of age or older with one infant aged between 4 and 12 months at time of enrollment; and (c) low-income mother–infant dyads as defined as infant receiving food assistance through WIC program. Mothers were excluded from the study if they had multiple births (twins, triplets, etc.) or their infants had chronic illness, prematurity or low-birth weight.

2.2. Procedure

WIC workers identified potential participants who met the study criteria. The staff informed potential participants about the study and

referred interested individuals to investigator. A Spanish-speaking investigator provided an overview of the study, answered any questions and obtained signed consent forms from participants. The institutional review boards (IRBs) of the University and the Department of Health approved the study. A Spanish-speaking investigator administered the surveys at the participants' home. Participants who completed the study received a \$20.00 gift card. Data collected included the following:

Demographics. Maternal sociodemographic information included: age, educational level, marital status, employment status, number of children and number of people living at home.

Perceived weight status of infant. The Baby Rating Scale (BRS) was used to assess the mother's perceived and desired weight status of the infant. The BRS consists of a line drawing continuum of nine babies who differ in size from leanest to heaviest. The mothers were asked to mark: (a) where they perceive their infant to be on the BRS (perceived weight), and (b) where they would like their infant to be on the BRS (desired weight). Response options range from 1 to 9, with higher scores indicating a heavier baby. The scale has shown to be a reliable tool to assess ideal and acceptable body sizes of infants, children, and adults (Rand & Wright, 2000).

Acculturation. A subscale from the Latina Mothers Child Feeding Practices Questionnaire (LMCFPQ) (Lindsay et al., 2011) was used to measure level of maternal acculturation. The subscale, 'about your culture,' consists of seven items and measures language preference and proficiency. Total scores range from 7 to 35, with lower scores indicating low acculturation level and preference for the Spanish language. The internal consistency (α) of the subscale in this study was .88.

Feeding beliefs. The Infant Feeding Styles Questionnaire (IFSQ) was used to measure maternal beliefs and approaches to controlling her infant's feeding behaviors (Horodynski et al., 2011). The instrument consists of two subscales: maternal feeding beliefs and maternal feeding behaviors. The feeding beliefs subscale consists of 22 items measuring maternal beliefs about infant feeding. Total scores range from 22 to 110, with lower scores indicating healthier feeding beliefs. The internal consistency (α) of the feeding beliefs subscale in this study was .83.

Temperament. The Pictorial Assessment of Temperament (PAT) was used to measure infant's temperament. The PAT is a 10-illustrated vignettes tool that requires the mother to select how she would categorize her infant's reaction to everyday situations as represented by drawings (Clarke-Stewart, Fitzpatrick, Allhusen, & Goldberg, 2000). Total scores range from 10 to 30, with the higher score meaning more difficult temperament. The PAT has been shown to have convergent validity with more widely utilized temperament questionnaires and has been validated with high-risk infants (Worobey, Islas Lopez, & Hoffman, 2008). For the purpose of this study, a native Spanish-speaker investigator translated the PAT into Spanish. An independent consultant back translated the tool into English. The internal consistency (α) of the PAT in this study was .65.

Dietary intake. Each infant's dietary intake was measured by a 24-hour diet recall. Each mother was asked to remember and report all the foods and beverages consumed by the infant in the previous day. The 24-hour diet recall is appropriate for this population because it does not require literacy and allows clarification of portion sizes, composition of foods, and quantity consumed (Reifsnider, Keller, & Gallagher, 2006). The food intake for 24 hours was analyzed for nutrient content using the Food Processor III (ESHA Research, Salem OR), a computer based software application composed of 50,000+ food items.

Food availability and insecurity. The LMCFPQ subscale, 'making ends meet,' measured food availability and insecurity. The subscale consists of six items. Total scores range from 6 to 24, with lower scores indicating a higher level of food insecurity in the home. The internal consistency (α) of the 'making ends meet' subscale in this study was .62.

2.3. Outcome measures

2.3.1. Maternal feeding practices

The Infant Feeding Styles Questionnaire (IFSQ) (Horodynski et al., 2011) second subscale was used to measure maternal feeding style

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