

Original Article

Understanding infant feeding beliefs, practices and preferred nutrition education and health provider approaches: an exploratory study with Somali mothers in the USA

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Abstract

The objective of this study was to explore Somali mothers' beliefs and practices around infant feeding and education, towards developing a culturally informed infant nutrition curriculum for health providers. Four focus groups were conducted to explore: (1) beliefs about infant feeding, hunger and ideal weight; (2) feeding practices; (3) nutrition education approaches; and (4) provider/mother interactions. Thirty-seven Somali mother participants identified the following themes within these topics: (1) strategies for assessing hunger, satiety and when to feed; shared beliefs that plump babies are healthy, leading to worry about infant weight; (2) context of breast milk adequacy, difficulties breastfeeding and environmental and cultural barriers to breastfeeding, leading to nearly universal early supplementation with formula; (3) preferred education approaches include provider visits with interpreters, Somali language educational materials and advice from older, experienced family members; and (4) desired health provider skills include: listening, explaining, empathy, addressing specific concerns, repeating important information, offering preventive advice and sufficient visit time. This study presents knowledge about Somali beliefs and practices that can directly guide discussions with these families. Given that these infants appear on a trajectory towards obesity, influencing infant feeding practices in the Somali community is a good upstream approach to preventing obesity. These findings will underpin a new infant nutrition curriculum for health providers.

Keywords: infant nutrition, breastfeeding, infant formula, health promotion, health knowledge, attitudes, practice, physician-patient relations, cultural competency, focus groups, Somali.

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Background

The prevalence of obesity among children has increased substantially over the last two decades

(Hedley *et al.* 2004; Ogden *et al.* 2006), with higher rates reported among low-income (Wang & Zhang 2006), ethnic minority (Hedley *et al.* 2004; del Rio-Navarro *et al.* 2004; Ogden *et al.* 2006) and immigrant

groups (Smith *et al.* 2003; Nelson *et al.* 2004). The link between childhood obesity and elevated chronic disease risk (including type 2 diabetes, hypertension and cardiovascular disease) (Dietz 1998; Dwyer *et al.* 1998; Freedman *et al.* 1999; Visscher & Seidell 2001; Barton & Furrer 2003; Hesketh *et al.* 2004; Williams *et al.* 2005) may cause health disparities to persist into adulthood among these disadvantaged groups and poses a significant public health problem in the USA.

A growing body of evidence links rapid growth during infancy with increased risk for childhood (Scaglioni *et al.* 2000; Gunnarsdottir & Thorsdottir 2003; Mei *et al.* 2003; Stettler *et al.* 2003; Toschke *et al.* 2004; Li *et al.* 2007) and adult obesity (Sayer *et al.* 2004; Field *et al.* 2005). Higher rates of infant overweight/obesity have been observed among some US immigrant populations compared with the general population. In 2004, one-third of Somali infants served by a Seattle Women, Infants and Children (WIC) program had 6- and 12-month weight-for-length ratios above the 90th percentile (an indicator of future overweight) (WIC Program Data 2004). These were the highest rates for all recorded ethnic groups, as categorized by program data. Factors that contribute to higher rates of infant overweight in some immigrant populations include maternal beliefs and practices (e.g. failure to associate excess weight with health problems) that are perpetuated by underlying structural and environmental factors such as lack of access to appropriate health services and education, socio-economic disadvantage, institutional racism and policies that make unhealthier foods less expensive (Baughcum *et al.* 1998; Etelson *et al.* 2003; Faith *et al.* 2003; Wilkinson & Marmot 2003; Benton 2004; Drewnowski 2004;

Drewnowski & Specter 2004; Nelson *et al.* 2004; Whitaker 2004; Dubois & Girard 2006).

Promoting infant nutrition and exclusive breastfeeding may be an important avenue towards addressing obesity and improving health overall in these populations. Studies have documented the role of exclusive breastfeeding (Arenz *et al.* 2004; Grummer-Strawn & Mei 2004; Johnson *et al.* 2006; Ip *et al.* 2007; Li *et al.* 2007), delayed introduction of solids (Wilson *et al.* 1998; Kalies *et al.* 2005; Johnson *et al.* 2006) and early initiation of healthy feeding attitudes and practices (Sayer *et al.* 2004) in preventing infant overweight and subsequent childhood obesity. Improving infant nutrition has wider implications over a person's lifetime because infancy is when the groundwork for dietary habits and nutritional adequacy is laid (PAHO 2003). Appropriate food and nutrition during infancy are also essential for physical growth, mental development and a healthy immune system (Hediger *et al.* 2000; WHO 2001). When these learned healthful habits and preferences are carried into adulthood, the likelihood of productivity, health and well-being are increased, and infectious and chronic disease risks are reduced (Birch & Fisher 1998; Bentley *et al.* 1999; Barton 2001). The benefits of breastfeeding, particularly exclusive breastfeeding, have also been well established. Breast milk has been widely recognized as the most complete form of nutrition for infants, with advantages ranging from nutritional, immunological, developmental, psychological, social, economic and environmental (American Academy of Pediatrics, Work Group on Breastfeeding 1997). In recognition of the importance of breastfeeding, Healthy People 2010 aims for 50% of all

Key messages

- Somali mothers reported a strong underlying cultural support for breastfeeding; a shared belief that plump babies are healthier; and the tendency for early formula supplementation because of concerns about breast milk adequacy, difficulties in breastfeeding and environmental and cultural barriers.
- Somali mothers identified provider visits with interpreters; Somali language educational materials; and advice from older, experienced family members as preferred infant nutrition education approaches.
- Health providers that work with Somali mothers are encouraged to emphasize listening, explaining and empathy when working with families with young children.
- Health providers should address specific concerns, repeat key points, offer preventive advice and grant sufficient visit time when working with Somali mothers and their infants.

mothers to continue breastfeeding through the first 6 months, and 25% to be breastfeeding exclusively (Centers for Disease Control and Prevention and Health Resources and Services Administration 2001; US DHHS 2006).

Given these multiple potential benefits of breastfeeding, it is unacceptable that health disparities persist in breastfeeding rates among different socio-demographic groups, including younger age, unmarried status, lower educational attainment, lower income and some racial/ethnic groups (Nolan & Goel 1995; Kuan *et al.* 1999; Li *et al.* 2002). Currently, what is known about barriers to breastfeeding in racial/ethnic minority populations comes from studies with low-income ethnic groups in the United States and the United Kingdom. These studies identify barriers to breastfeeding at multiple levels (e.g. structural, individual) that influence each other and contribute to formula supplementation and early discontinuation: work environments that do not support breastfeeding, lack of access to prenatal care and health education, embarrassment about breastfeeding in public, a bottle-feeding/formula feeding culture among family and friends, difficulty with breastfeeding, perceptions of insufficient milk supply or the infant not getting enough milk and lack of knowledge about breastfeeding benefits (Barber *et al.* 1997; Carothers 2005; McFadden & Toole 2006; Merewood *et al.* 2006; Hurley *et al.* 2008).

Our study was undertaken in this context of both disparities in infant overweight recognized in the local Somali community (WIC Program Data 2004) and of Healthy People 2010's key goal to eliminate health disparities (US DHHS 2000). Because 'ethnic group' lacks such an 'objective' basis, its use requires researchers to define their construction of it and to justify its validity, reliability and consistency (Oppenheimer 2001). In this study, ethnicity was defined by researchers and by Somali caregivers as being born in Somalia. By focusing on an ethnic group for this study, we recognize the underlying complex interactions between race (as defined in this society), ethnic origin and socio-economic status (Bennett 1997). This broader context is important to not perpetuate individualistic explanations for health disparities (Bennett 1997). Focusing on ethnicity, vs. race, is also important;

as a social construct, each ethnic group contains a history (including cultural and behavioural attitudes and beliefs, lifestyle patterns, diets, environmental living conditions and other factors) and alters over time (Haynes & Smedley 1999). Using an ethnic (vs. racial group) is intentional so that we are sensitive to the effects of generation, changing economic status, social class, relations with other groups, discrimination and relative political power (Oppenheimer 2001).

At present, little is known about Somali immigrants' values, attitudes and practices regarding infant feeding, and the role of public health and health care providers in promoting infant nutrition. Somali immigrants are relatively new to the USA, arriving after the collapse of their government in 1991 and the beginning of civil war. Since then, 8000–12 000 refugees have settled in the Seattle area (Ethnomed 1996), representing up to 30–45% of the US Somali population (US Bureau of the Census 2000). A local organization working to help ensure underserved communities receive full access to culturally and linguistically appropriate, quality health care found that most Seattle-area Somali families are Muslim and continue traditional dress and cultural practices (CCHP 1996).

Primary care providers (PCPs), health educators, WIC clinicians and other health providers in community-based settings are a potential support for breastfeeding and infant nutrition. These providers offer a unique opportunity to influence these practices in immigrant populations, as these providers are often the only consistent professionals involved with infants from underserved families (High *et al.* 1998) given structural barriers such as lack of access to care. A recent review of mothers' and health care providers' experiences and beliefs of breastfeeding support found that support from health services was viewed unfavourably, with promotion of unhelpful practices, conflicting advice and lack of guidance from providers (McInnes & Chambers 2008). In addition, cultural bias or failure to recognize how culture and life circumstances affect health can result in inadequate care (Walker & Jaranson 1999). These findings suggest that health providers may benefit from gaining skills in promoting self-care within an understanding of a family's social and cultural context. Greater understanding of Somali immigrants' cultural context is

particularly relevant for health providers by situating breastfeeding promotion in the context of women's lives (Mulford 2008).

Given present disparities in the local Somali community, our overall project goal is to develop a culturally informed curriculum for training PCPs to address infant nutrition effectively. Prevention science guidelines recommend that programmes be culturally relevant and sensitive (Coie *et al.* 1993), targeting both physical and subjective features, such as norms, family roles, communication patterns and values (Betancourt & Lopez 1993). Interventions that are culturally specific have been shown to effectively promote breastfeeding in other immigrant, ethnic groups (Young & Kaufman 1988; Rossiter 1994). As such, our first step in curriculum development was to conduct focus groups with Somali mothers to better understand beliefs about infant feeding, hunger and ideal weight, feeding practices, nutrition education approaches and provider/mother interactions.

Materials and methods

Guba and Lincoln (1989) have identified four criteria for establishing the trustworthiness, or rigor, of qualitative research studies: credibility, transferability, dependability and confirmability. These concepts parallel the conventional research notions of internal validity, external validity, reliability and objectivity (Halldórsson & Aastrup 2003), but are more appropriate for naturalistic studies. *Credibility* entails the confidence in the truth of the data, or how well the constructed realities of respondents match those as represented by the researcher. *Transferability* is the degree to which findings from the data can be transferred to other situations. *Dependability* relates to the consistency between the data and the findings. *Confirmability* refers to the neutrality of the data such that two or more people can agree about the meaning of the data. These concepts are utilized in describing the methods for sampling, data collection and data analysis for this study.

Approach and sample

This study used a qualitative grounded theory approach, an inductive theory discovery method that

allows researchers to develop a theoretical explanation of general features of a topic, while concurrently grounding the explanation in empirical data (Glaser & Strauss 1967). To fulfill our study objectives to better understand infant feeding beliefs, practices and preferred nutrition education and health provider approaches in Somali caregivers, a purposive sampling approach (Trochim 2001) was used to recruit a range of participants. Recruitment was through English and Somali language flyers at local pediatric and WIC clinics serving a culturally diverse, low-income population. Eligible caregivers were also recruited by WIC staff and through existing participants for subsequent focus groups. Eligibility criteria for inclusion in the study included: being a primary caregiver for at least one child less than 19 months old; belonging to the Somali ethnic group (defined by both participants and researchers as being born in Somalia) and residing in the greater Seattle area (including the city of Seattle and surrounding communities in King County). In addition to defining eligibility criteria to allow for participants with a range of demographic, socioeconomic and immigration characteristics, a range of recruitment methods was used to help ensure credibility. Study protocol was approved by the University of Washington Human Subjects Division.

Data collection

This research study employed focus groups for data collection. Focus groups are ideal for this research as they capture real-world perspectives on topics where data are limited (Anderson *et al.* 1996; Maillet *et al.* 1996; Manfredi *et al.* 1997; Dunn *et al.* 1998; Mein & Winkleby 1998). Diversity of information is generated and participant interaction triggers discussion of issues that may not have been considered by researchers (McDaniel & Bach 1994; Rupenthal *et al.* 2005). Focus groups align with the strong oral tradition in Somali culture (Nevid & Maria 1999; McGarvey *et al.* 2006), and the mutual support fostered by focus groups may also be an asset for participants (Twinn 1998; Murdaugh *et al.* 2000; Owen 2001; Watters 2001; Weine *et al.* 2003).

Focus groups were conducted at two clinics – a large public hospital and a public health clinic. A Somali

meal was provided to foster a familiar, trusting environment (Krueger & Casey 2000), and participants received \$30 for time and transportation costs. Each group was facilitated in English by a study investigator (DJ, AH) and a Somali interpreter. The study investigator had extensive experience in conducting focus groups for research in public health nutrition, and the interpreter was trained both in medical settings and by research staff. Sessions were audio-recorded with a note taker present to capture major concepts. Each 90-min session began with a brief introduction and description of the study purpose by the group facilitator. A written informed consent process was conducted (in both English and Somali language materials), and a brief demographic survey was self-administered. Because the informed consent process was new to some study participants and literacy was low among some members, the interpreter checked with each participant to read the form and address any questions before the consent form was signed. The facilitator then emphasized the confidentiality of the focus group discussion, and encouraged participants to share, to respect each other's opinion and to understand that there are no right or wrong answers.

The study team developed a focus group guide to gather perceptions on target beliefs and practices. Guide topics were selected after a review of the research literature and current practices of the pediatricians, dietitians, family physicians and public health practitioners on the research team. Topics and sample questions included perceptions of infant feeding and hunger (e.g. 'How do you know if a baby is hungry'), perceptions of infant weight (e.g. 'What are the benefits of a child being plump or fat?'), feeding practices (e.g. 'How is breastfeeding different in the US compared to Somalia?'), nutrition education approaches (e.g. 'How does your doctor give advice to you about your children's nutrition?') and provider/caregiver interactions (e.g. 'What makes you trust or not trust your provider's advice about infant feeding?') The guide was semi-structured to allow participants to express views freely while providing questions and probes for eliciting information on key topics (Morgan 1997). Questions were open-ended to elicit participant's own language, meaning and concepts, and were worded neutrally to reduce response bias. The open-

ended format of questions was particularly important given that questions were translated from English to Somali, then responded to using participants' preferred language and own connotations, and these responses were then translated back to English from Somali where appropriate. During each focus group, the facilitator worked with the interpreter to ask questions and probe for deeper responses. One strategy to increase confirmability, or to limit bias, was to follow each focus group with a debriefing session of study staff (including non-Somali researchers and Somali interpreters). The aims of this debriefing were to share first impressions, summarize key findings, compare the session with previous sessions, clarify concepts translated from English to Somali or Somali to English and refine guide questions as needed for subsequent groups.

Data analysis

A content analysis approach was used to analyse the data collected from the focus groups (Roberts 1997; Ulin *et al.* 2005). Content analysis is a method for uncovering patterns in participants' accounts to identify trends. All audio recordings were transcribed in English for analysis. To ensure credibility, member checking was conducted by a Somali interpreter who listened to the audio recordings to verify the accuracy of translation of words and concepts. There were no concepts that emerged during the focus group that were problematic to translate. Transcripts were then imported into NVivo (QRS release 6.0), a qualitative software program that allows researchers a way for coding, retrieving, reviewing and recoding textual data.

Utilizing the software, two researchers (LS, GK) coded the transcripts using descriptive words or phrases that related to the study purpose (Krueger & Casey 2000). Initial codes included topics related to the focus group guide, such as 'how to tell if the baby is hungry', 'benefits of plump babies' and 'breastfeeding practices'. After comparing initial coded transcripts and consultation with the research study team, further coding led to the elaboration of some codes and elimination of others until a systematic coding scheme was developed (Berg 1998). For instance, the

general code used to describe 'breast milk practices' was eliminated, and more specific codes about breastfeeding were added, including 'preference for breastfeeding', 'reasons for breastfeeding', 'night breastfeeding', 'difficulties with breastfeeding' and so on to capture the different nuances of breastfeeding practices and beliefs that were described by study participants. After the list of codes was finalized, transcripts were double-coded by two team members to help ensure dependability. The researchers reached 85% agreement and resolved remaining differences through additional discussion or assistance from the project investigator. Coded transcripts were then organized into the topic areas of interest, and one research team member (LS) outlined the relevant themes that emerged. This outline of themes, along with sample coded transcripts to illustrate each theme, was reviewed and edited by all members of the research team to help enhance the confirmability of the findings. Data are presented textually with quotes to illustrate study findings.

Results

Four focus group sessions with 37 Somali mothers were conducted in spring 2006. We originally intended to recruit both mothers and fathers of young children; however, only female caregivers responded to our recruitment efforts. More participants were recruited by WIC staff and word of mouth of other participants than through flyers at the local clinics. In-person recruitment was believed to be more successful because of the personal connection and trust in person doing the recruitment. Some participants are low literate or illiterate, which further impeded recruiting by flyers. In some cases, flyers were helpful in initiating dialogue between potential participants and WIC staff, after mothers viewed the flyers in the waiting rooms of clinics.

The four focus groups ranged in size from three to eleven participants, with each group including a mix of age, number of children, education, employment and time in the USA. Mothers ranged from 21 to 51 years old (mean age 30.8), with one-third currently employed and over three-quarters with less than a high school education. Half of the participants arrived

Table 1. Demographic characteristics of focus group participants

Demographics	Mean/%*
Age	30.8 (range 21–51 years)
Gender	100% female
Employed	31%
Less than high school education	77%
Language	
Speak Somali as main household language	93%
Think primarily in Somali	64%
Speak English 'well' or 'very well'	67%
Immigration history	
Arrival in USA between 1992 and 1999	55%
Arrival in USA between 2000 and 2005	45%
Immigrated to USA via another country	48%
Caregiving	
Number of children under age 18	3
Household size (including mother)	5.5
Caregiving help from other household members	75%
Caregiving help from persons outside the household	32%

*% reported excludes missing responses.

in the USA between 1992 and 1999. Participating mothers had an average of three children, and most received caretaking help from family members in the home. The focus groups were conducted in both English and Somali, reflecting that most participants reported speaking Somali at home and two-thirds indicated that they speak English 'well' or 'very well.' The use of both languages did not appear to affect participation during the focus group. Additional demographic data are provided in Table 1. Characteristics of study participants and setting are important to take into account when considering transferability of these findings to other groups or settings.

Focus group findings are reported by the following major topics: (1) beliefs about infant feeding, hunger and weight; (2) feeding practices; (3) nutrition education approaches; and (4) provider/mother interactions. A summary of results is provided in Tables 2–4.

Beliefs about infant feeding, hunger and weight

Most Somali mothers identified using a range of methods for recognizing infant hunger and satiety, such as infant body language, ability to sleep, timing of feeding and refusal of food. Timing feedings based on the previous feeding or a set amount of hours was

Table 2. Focus group findings: beliefs about infant feeding, hunger and weight

Beliefs about infant feeding and hunger		
How to assess infant hunger	<ul style="list-style-type: none"> • Crying • Trouble sleeping • Breast engorgement 	<ul style="list-style-type: none"> • Finger sucking or opening their mouth • Set amount of time between feeds
How to assess infant fullness	<ul style="list-style-type: none"> • Quantity of food • Baby's body language (e.g. turning head from side-to-side) • Ability to sleep (although some young babies sleep even when hungry) • Refusal of breastmilk/formula (often via spitting, vomiting or burping) • Timing of feeding (many breastfeeding moms had difficulty assessing breastmilk adequacy) 	
Beliefs about infant weight		
Ideal weight for Somali infants	<ul style="list-style-type: none"> • 'Average' • 'Just the right plump' 	<ul style="list-style-type: none"> • 'Not too much big, not too much fat, not too much skinny'
Positive attitudes towards overweight babies	<ul style="list-style-type: none"> • Better health and protection from sickness, especially for young baby • Traditional Somali belief of fat baby as healthy and skinny baby as sick • History of food scarcity and malnutrition (in Somalia, refugee camps) 	
Consequences of being too heavy	<ul style="list-style-type: none"> • Diabetes • Heart problems • Low iron 	<ul style="list-style-type: none"> • Mobility issues (e.g. difficulty crawling or walking). • Later in life, teasing, laziness/lack of energy and difficulty concentrating
Determining appropriate weight gain	<ul style="list-style-type: none"> • Fit of clothes • Baby's appearance 	<ul style="list-style-type: none"> • Monthly weight gain amounts • Familiarity with weight from lifting the baby often
Speed of infant weight gain	<ul style="list-style-type: none"> • Some believed in pacing feeding to prevent obesity 	<ul style="list-style-type: none"> • Others were so concerned about their baby's growth that they woke them in the middle of the night to feed them.

used by most mothers to judge when to feed. This differed from when mothers resided in Somalia: 'when she had the babies, she never watched the time or scheduled feeding her children'. Breastfeeding participants who did not time feedings had difficulty in assessing whether the baby received enough milk. For some breastfeeding mothers, the amount of time spent on each breast was also an important indicator of satiety: 'I breastfeed 15 min on each breast, then I know the baby got enough milk'.

In addition to discussing beliefs about infant hunger and satiety, the participants were asked to describe their model infant weight. Somali mothers identified 'average' as their ideal baby weight, further defining average as 'just the right plump', although not wanting a child that is 'over-fat, like obesity . . . just middle'. Positive attitudes towards an overweight baby stemmed from traditions in Somalia: 'when the child is fat, we think he's healthy; when the child is skinny, we think he's sick'. The participants commented that infant chubbiness is particularly important for health up to 6 months old, protecting the baby during sickness (which frequently involves weight loss).

In all of the focus groups, worrying about infant weight emerged as a universal attitude among Somali caregivers: 'they all worry about that'. Mothers believed their child is 'more susceptible to getting sick real quickly if he's not at his ideal weight'. Mothers described not worrying as much about their baby's weight when they are 'plump', because plumpness is linked to health, strength and beauty. Some parents believed pacing feeding was important to prevent infants from getting 'too chubby', while others woke their babies for night feedings because of concerns about slow weight gain.

Feeding practices

Breastfeeding

A majority of the Somali mothers breastfed for roughly 1 year, although most did not breastfeed exclusively. Duration of breastfeeding depended on other familial responsibilities, beliefs about nutritional adequacy of exclusive breastfeeding and difficulties with breastfeeding. All Somali mothers

Table 3. Focus group findings: feeding practices

Feeding practices	
Amount of time breastfeeding	<ul style="list-style-type: none"> • Most mothers breastfed 1 year (range: birth–2 years) • Mother responsibilities (e.g. work, home, children)
Rationale for breastfeeding	<ul style="list-style-type: none"> • Infant preference • Mother–infant bonding • Help baby sleep • First milk makes baby sick • Colostrum not breastmilk • Public feeding done in private and covered • Traditionally not done in front of males, but in some cases done with US male providers • Limited experience with breast pumps in Somalia • Desire for low-cost pump given work and other demands • Pumps are a way to increase milk production • Some concerns given Somali belief about milk going bad if sited in the breast • Infant refusal even with healthy child and engorged breasts; unknown how to address this • Inadequate milk production (because of environmental pressures in USA). Limited knowledge of how to increase milk production, or if this is even modifiable • Hard to assess if infant got sufficient milk. Infants' fussiness or crying, refusal to breastfeed, difficulty sleeping and sore nipples as indicators viewed as indicators of this
Challenges with breastfeeding	<ul style="list-style-type: none"> • Belief that exclusive breastfeeding is insufficient for adequate infant growth • Fluids (e.g. milk, tea) and liquid foods (e.g. soup, grits) • Using a breast pump
Ways to increase breastmilk	<ul style="list-style-type: none"> • Breastfeed more • Signs of sufficient breastmilk: burping after feeding, sleeping, engorged, heavy breasts • Environmental demands (work, other children, housekeeping), many contribute to decreased breastmilk • Hard to tell if infant got sufficient breastmilk • Cow milk and diluted juice (not tea because sweet and caffeine) • Mashed/blended adult food • No jarred baby food because not fresh • Given food from adult plate • Preference to feed baby vs. self-feeding to ensure adequate intake, reduce mess, have more time
Rationale for formula	<ul style="list-style-type: none"> • Breastfeeding refusal • Concerns about adequate weight gain
Introduction of solids	<ul style="list-style-type: none"> • Initiated at @6 months • First foods: baby cereal, porridge, rice, pasta, fruits
Methods for feeding solids	<ul style="list-style-type: none"> • At first spoon fed or bottle • Later (9–12 months) on lap, high chair or own chair
Other traditional practices	<ul style="list-style-type: none"> • During Ramadan, breastfeeding mothers may postpone their fasting until later in the year when they are not breastfeeding. Not all participants practice this • Refusal of breast by baby • Insufficient milk production • Beliefs about nutrition adequacy of exclusive breastfeeding • Soothe crying baby • 'Being good for my babies health' by aiding growth and preventing sickness • Concerns because it sits in breast too long • Full of nutrition (learned from US doctors) • Honey may be rubbed on infants lips or gums for medicinal purposes (e.g. to heal blisters on their lips, to prevent colds) or to soothe a teething baby • Most mothers are aware that honey is not good to feed the infant because of its high dose of sugar, although few were aware of the risk of botulism to infants under 1 year.

Table 4. Focus group findings: nutrition education and provider/mother interactions

Nutrition education approaches	
Beliefs about growth charts	<ul style="list-style-type: none"> • Most mothers recognized the charts • Few understood correctly how the percentiles corresponded to their child's weight • Instead of percentiles, mothers were most interested in how much their baby should weigh
Preferred information and approaches	<ul style="list-style-type: none"> • Desired info on appropriate foods; breastfeeding; and ways to address difficulties, timing of feeding and other tips to help their baby grow healthy and strong • Approaches include doctor visits, classes, flyers, brochures and videos in Somali language • Written or video formats are useful reminders of lesson from doctor visits or classes • Interpreter present if needed • Mother combines doctor's advice, family, friends and maternal instinct to make decisions
Provider/mother interactions	<ul style="list-style-type: none"> • Listening • Repeating important information regularly • Responding to their needs • On-time appointments, sufficient visit duration • Empathy • Being asked to share their perspectives • Advice on prevention and treatment • Explaining the rationale behind advice • Agreement with provider's advice when saw positive benefits • Challenge when contrasts with family and friends, tradition or maternal instinct • Sometimes filtered advice through others' advice and maternal needs
Doctor's advice	<ul style="list-style-type: none"> • Some mothers believe that providers needed to understand their experience more, but that some progress has been made. • A few mothers focused on appropriate infant nutrition and feeding practices for all infants in the USA.
Mixed opinions of providers understanding of Somali culture	

reported that they fed their babies every 2–3 h, with spacing between feedings increasing as the babies get older. Rationales for breastfeeding included making the mother and baby ‘closer’, being ‘good for my baby’s health’, being preferred by the baby and being ‘the best milk that anyone can feed their baby [because] that’s what God gave us to feed the baby’ (the Koran recommends breastfeeding for 2 years). Breastfeeding the baby also contributed to maternal–infant bonding and made the mother and baby ‘closer’ than formula feeding. As one mother remarked: ‘the boundary between mommy and the baby comes by breastfeeding for a long time’. In addition to benefits to infant health, some caregivers breastfed to soothe their crying baby or to help them get to sleep. There were diverse opinions among participants about feeding babies at night, although most agreed that breastfeeding (over formula) was preferred at night for its soothing properties and/or because babies preferred it.

P3: If you want to put a kid to bed, it’s quicker to first breastfeed because that relaxes him and that seems to help the baby fall asleep quicker.

I: Anyone else?

P: Like for each, for all my kids, I don’t give them formula at night at all; it’s all breast at night.

P4: I wish I had a baby that will wake up at night; my kids when they need formula they don’t wake up at night. I have to wake them up.

P2: It’s at night that I give the breast milk because like she doesn’t wake up for formula so it’s at night when I give her the breast milk. During the day, I give formula.

As articulated above, some mothers woke their baby to feed them at night because of concerns about optimal weight gain, while other mothers let babies sleep or fed their babies only if they woke up on their own. In addition to helping the baby sleep, a few caregivers commented that they breastfeed their baby to keep it from crying to diminish disturbing other family members or guests. Other caregivers cautioned against feeding a baby unless they were hungry, and encouraged using other methods to quiet the baby, such as playing.

Somali mothers were also asked to give their perspectives about colostrum. The participants had

mixed opinions: some mothers held the traditional Somali belief that feeding ‘the first milk in the breast makes the baby sick’. These mothers had heard this from family and friends, and waited to breastfeed until several days after the birth. Other participants believed that ‘colostrum is fresh [because it] came the first time from the mother’s breast’, but expressed strong beliefs about breast milk that sits in the breast too long: ‘her mom says . . . if she goes out and doesn’t feed the baby 2 h and comes back, the milk that is in the breast . . . it’s old, don’t feed the baby’. A few mothers reported feeding colostrum only since arriving in the USA, based on doctors’ advice that ‘there’s a lot of nutrition in there’.

Regarding public breastfeeding, most mothers felt this was not traditionally acceptable but permissible when the baby was hungry: ‘It’s not okay, but it’s okay if you have to feed the baby’. The participants shared that ideally, public breastfeeding is done somewhere private and under garment wraps. Mothers were generally comfortable breastfeeding in front of female health providers, and much less so for male providers. The participants were also asked their opinions of and knowledge of breast pumps. Most mothers had limited experience with pumps, although some expressed interest in using breast pumps given competing demands and desire to maintain breastfeeding. Some mothers recognized pumping for saving breast milk and as a method for increasing breast milk production. A few participants were sceptical of using pumped breast milk, given the traditional belief that breast milk spoils after ‘too much time in the breast’.

Breastfeeding challenges and supplementation

Concerns about adequate infant weight gain, insufficient breast milk production and little knowledge of strategies to overcome breast refusal led to early supplementation with formula or ceasing breastfeeding altogether. Many mothers attributed breast milk refusal to inadequate milk production caused by lifestyle changes in the USA. Traditionally in Somalia, mothers spent the first 40 days of the infant’s life at home (*Umol Bah*), breastfeeding exclusively:

But here, you either have to go back to work or you have to look after the other kids, whether it is taking them to school

or the bus stop, so there is something that comes in between you and the baby here. You don't get enough rest, you don't even remember to take enough to drink, and for your breasts to produce milk, you have to be drinking a lot of fluids.

Most mothers also supplemented breast milk with formula early on because they believed they did not have enough milk in their breast. Some caregivers viewed their infants' fussiness or crying during or after breastfeeding, refusal to breastfeed altogether, difficulty sleeping and sore nipples as indicators that their baby did not get enough to eat from breastfeeding only.

P3: I give to him the breast milk first and after that if he stills need milk, then I give him the formula.

P2: I don't feel my breast is producing the milk and when I notice the kid, he's not getting enough, he's still agitated, then I give him some formula.

P: Because if there is not enough in the breast . . . if the breast is not nutritious enough, of course the kid will refuse.

Most of the caregivers were uncertain about how to increase breast milk production, and one mother even suggested that milk production was not modifiable: 'it's just the way that the person was made'. Some mothers identified two strategies for increasing breast milk production: breastfeeding more and drinking plenty of fluids. Mothers gave examples of milk, tea, water and other drinks, as well as soup, beans, grits, cream of wheat, oatmeal or other porridge as helpful for breast milk production. Traditionally, 'back home when a lady gives birth, every morning up until 6 weeks or something she would drink, she says, like goat soup . . . then she will have the porridge, that will help too'. In addition, Somali women have traditionally been encouraged 'to drink a lot of tea with milk in it . . . tea with whole milk, and then you drink a lot of fluids. To produce a lot of milk'. Caregivers identified burping after feeding, sleeping and engorged, heavy breasts as signs that the mother has enough breast milk.

Many mothers also expressed the challenge of knowing how much milk the baby received from breastfeeding. This uncertainty further encouraged mothers to supplement breast milk with formula to ensure that their baby received enough nourishment:

'One thing you cannot tell is your breast milk. You don't know how much the baby took, you know, your breast so adding your formula it's very tough how you're going to decide it'. A few caregivers questioned the capability of breast milk only for the baby's growth. One mother remarked that 'breastfeeding would not help the baby to grow so she was mixing both breastfeeding and cow's milk, that's from birth to 2 years old. [In Somalia], she gave both her own cow and goat milk'.

In addition to concerns about breastfeeding and breast milk adequacy, mothers also fed their babies formula because of demands from work, other children and family members and housekeeping. Some caregivers feed formula to help the baby sleep at night: 'She feeds the breast milk as much as he needs, but the baby keep crying and when she gives only 1 oz more of formula, she will burp and go to sleep. Otherwise, she can stay awake all night'. Working mothers may opt for formula because they do not have enough time for breastfeeding, or as a result of their breast milk production decreasing from reduced breastfeeding time. For busy moms, formula feeding may also be preferred to breastfeeding because other caregivers can assist with the feeding: 'I would have just stopped and start giving them the formula because the formula's easier and anyone can help me feed it, like the father of the baby could do it, my siblings could help, anyone could do it. But the breast, it's just me'.

Introduction of solids

Most mothers initiated solid food at around 6 months, although some introduced solids earlier because of concerns about breast milk adequacy or limited time for breastfeeding. Typical first foods are listed in Table 3. A few mothers reported staggering the introduction of different foods, while most indicated that after 6 months, 'any food I'm eating I give to them'. Most mothers did not feed commercially prepared baby food because of concerns about the lack of freshness. Feeding a child the same food as adults stems from the traditional Somali practice of eating from one shared plate, and mashing or blending adult food is a common practice. Solid food is often first introduced with a spoon or bottle, then self-feeding

via high chair, mother's lap or shared plate; however, some mothers continue feeding solids to babies who are able to self-feed to better manage and control feeding and messes.

Other traditional practices

Some traditional Somali infant feeding practices, such as breastfeeding and encouraging the mother to drink plenty of fluids, have continued after Somali families moved to the USA. Other cultural traditions mentioned during the focus groups include honey and Ramadan. Honey is often rubbed on lips or gums for medicinal purposes, or to soothe a teething baby: 'Our religion says that honey . . . the bee made the honey from the nectar that she collected from all different kinds of trees. And there are all kinds of medication in there and it's very helpful for the health'. Most mothers are aware that honey is not appropriate to feed infants, although few knew of its risk of botulism.

During Ramadan (the ninth month of the Islamic calendar marked by fasting, prayer and charity), breastfeeding mothers may postpone their fasting until they are not breastfeeding. A few participants remarked that some breastfeeding mothers delay fasting, while others observe the fast and supplement breastfeeding with formula.

Nutrition education approaches

Somali mothers were also asked about current and preferred strategies for learning about infant nutrition. One specific approach is the CDC Growth Chart, a tool that is commonly used during preventive health visits and is recommended by the American Academy of Pediatrics (AAP) to monitor child growth (AAP 1998). While most focus group participants recognized what growth charts were, few understood how the child's percentile corresponded to the child's weight. The participants were most interested in how much their own baby should weigh at a given age, suggesting that a specific desired weight for each individual baby, as opposed to percentiles, should be discussed.

Somali mothers stated that they typically receive advice about infant nutrition from doctors and older

family members with parenting experience (e.g. mothers and grandmothers). In general, doctors and other health providers (e.g. WIC dietitians) are regarded positively in the Somali community. Many mothers also spoke about trusting their own instinct as a mother: 'when you become mom, you know what to do'. Somali mothers also desired information about infant feeding through doctor visits and Somali language classes, flyers, brochures and videos. Having interpreters was also seen as helpful because they 'will sometimes simplify things that the doctor says . . . so that makes it easier for us to understand'.

Provider/mother interactions

During interactions with their infants' doctor, Somali mothers valued being listened to, sharing their perspectives and having sufficient time: 'you want the doctor to have the time, discuss with you, ask you a lot of information about your opinion and your ideas'. The participants were pleased when their doctor responded to their needs ('they worry when you worry') and empathized with the parent. When providers explained the rationales and repeated important information, this improved the likelihood of following their doctors' recommendations.

The participants were less likely to follow doctors' advice for a variety of reasons that often overlapped, such as placing higher value on mother's intuition (over the doctor's recommendation), following Somali cultural beliefs (instead of US beliefs, which they believe in inform the doctor's advice) or seeing what they perceive as negative results when the advice is followed. This plays out in the following focus group discussion:

I: Is there any reason why you think you wouldn't follow the doctor's explanation?

P2: Yes, because sometimes even the doctor, he is human and he could make a mistake. Mental errors. Mother may have her instinct, maybe this is not quite like let's take even a prescription, if he wrote the dose for the prescription, maybe you know, bigger than what the baby's supposed to receive, the mother might think, 'Oh, maybe this is too much for my daughter or my son', so yeah, doctors can make mistakes.

I: Yes?

P3: Let's just say my kid, I will bring him to the hospital and the doctor will tell me, give him like a Pedialyte Popsicle [nutritional popsicle with electrolytes]? In my culture, when my kid has a cold or symptoms of cold, you don't give him cold stuff, so something like that wouldn't do.

I: So does any of you

P4: You can try fat first and see what the doctor says, give him the popsicle, but if it seems like it's making him worse, no better, then you don't need to do that again.

P5: Sometimes, the best thing is not to follow a prescription like when it causes drowsiness, when you give them the first time they will fall asleep or they feel sick, they are not going to move, they are not active all day? So, I always call the doctor and say this is too much – sometimes I will do half the dosage, so it works. Instead of the whole, the dosage he's given me. If it's hald, then they will be active.

This passage suggests several strategies that Somali mothers employ when they do not agree with the doctor's advice and do not reject their recommendations outright. Some mothers may try to follow their doctors' advice at first, and then stop if it is not working. Others described combining their own instinct with their doctor's advice to come up with a compromise.

The focus group participants reported that sometimes advice was similar among providers, family and friends, while other times, doctors differed along cultural lines (e.g. US/Western medicine vs. Somali/traditional medicine). One mother summed it up this way: 'The doctors tell the mothers what to learn, but the mothers tell you [what is] traditional . . . and sometimes [they all tell you] the same'. Mothers had different opinions about how providers understood them culturally, as Somali, as illustrated in the interaction below: the first participant articulates the belief that providers needed to better understand their experience (because everyone has a culture that should be understood), while others recognize some improvement:

P3: Everybody has a culture. He should know that I have.

P4: . . . when we came to this country, the first wave of Somalis – when you come, a male doctor usually gives you a hand shake . . . and we used to hold our hands back because that's our culture . . . what happens is the doctors now realize that – we used to apologize and say I can't hand

shake to you, but now they understand and . . . they don't ever try to shake our hands. So, culturally they're learning. Getting there.

Discussion

Study findings demonstrate the complexities of breastfeeding in the context of women's lives (Mulford 2008). Environmental pressures and structural barriers in the USA make exclusive breastfeeding challenging for Somali mothers compared to living in Somalia where extended family and cultural norms encouraged breastfeeding and provided substantial support. Concerns about public breastfeeding and limited access to and experience with breast pumps also reduce opportunities for breastfeeding after mothers return to work. Study participants reported strong cultural support for breastfeeding in the Somali community with all the participants breastfeeding at least 1 year. Even with this underlying support for breastfeeding, difficulties with breastfeeding, lack of knowledge about the importance of exclusive breastfeeding, challenges with judging the amount of breast milk taken and the aforementioned environmental barriers influence mothers to supplement breastfeeding with formula in early infancy or to stop breastfeeding altogether. Traditional cultural beliefs, such as preferences for a 'plump' baby and the opinion that breast milk spoils in the breast after several hours, may further encourage early supplementation. There were also a range of opinions and practices suggested during the focus groups reflecting the diversity within the Somali ethnic group. For instance, a number of mothers believed their infants were hungry if they were not able to sleep, while others thought that a sleeping baby needed to be woken up as they would sleep through their hunger. Some viewed their experience in a context specific to Somali culture, and other mothers framed their experience from the lens of what a good mother would do.

Comparing to other literature

Our findings are consistent with unpublished studies on infant nutrition and feeding practices of other Somali communities in Minnesota and Washington

(Haq 2003; Werner 2005); most published maternal and child health studies of Somalis focus on prenatal care. Furthermore, there are similarities between the Somali immigrants' experience in this study and those reported in a recent knowledge, attitudes and practices study (KAPS) on infant and young child feeding practices in Somalia (Food Security Analysis Unit, Somalia 2007). The KAPS found that breastfeeding is acceptable to Somali mothers and their social support networks, and that a majority of their children breastfeed on demand. Frequent supplementation of breastfeeding with water, animal milk or foods (as the child gets older) were also reported, given the common belief among mothers and their networks that breastfeeding alone is inadequate for the child. Similar to our study, the KAPS identified a combination of cultural beliefs and inadequate knowledge as possible contributors to an unsupportive environment for exclusive breastfeeding. It is important to note that the beliefs, attitudes and practices of our study participants may not reflect that of other Somali immigrants in the USA, or in Seattle for that matter, and readers are strongly advised to avoid homogenous conceptualizations of ethnicity that perpetuate further stereotypes and misunderstandings (Cashmore & Jennings 2001).

In addition, several studies have been conducted to explore infant nutrition and feeding practices among racial/ethnic groups in the USA. A recent survey of Hispanic, African American and white mothers investigated how breastfeeding practices and beliefs vary by race/ethnicity among a low-income sample in the USA, although did not report findings by whether the respondents were US born or immigrants (Hurley *et al.* 2008). Study findings from Hispanic and from African American respondents both compared and contrasted with findings from our small study of Somali immigrant mothers. For example, findings were similar on insufficient breast milk being a common reason to stop breastfeeding; on the other hand, different reasons were reported for not breastfeeding (fear of difficulty or pain during breastfeeding). In another study of immigrants and native US women, non-US-born mothers (many of whom experience many practical and financial obstacles) were far more likely than US-born women to breastfeed (Merewood *et al.* 2006).

Some of these findings are not unique to ethnic minority groups, as suggested by a recent study of white, educated, middle-income women which demonstrated how breastfeeding knowledge and formula supplementation negatively affected breastfeeding outcomes (Chezem *et al.* 2003).

Further studies explore the nuances inherent in looking at ethnic groups and remind us that there are differences among groups. For instance, Hispanic women of Puerto Rican and Cuban descent typically turn to their mothers for breastfeeding support, while Mexican women express wanting to utilize hospital and other health care staff for support as well (Gill *et al.* 2004). Other factors, such as level of acculturation, time in USA, education, income, employment status and marital status, contribute to differences in beliefs and practices within ethnic groups (Gorman *et al.* 2007). Despite these similarities among different ethnic groups, the importance of this study is identifying cultural beliefs and practices that are particularly influential for Somali mothers. Just as modesty is suggested as a large obstacle in a recent focus group study of Mexican Americans (Gill *et al.* 2004), preference for a plump baby and the perspective that milk stored in the breast for too much time will spoil, appear to be significant cultural beliefs for Somali mothers. Further exploration is needed to confirm whether these findings hold true for other Somali mothers in the USA.

In comparison to the literature on underserved communities, much of the literature on beliefs and practices around infant nutrition and breastfeeding are limited to outside the USA and focus on low-income populations. Some key study findings that are similar to these data include the perception that infant nutritional and hunger needs are inadequately met by breast milk alone (Ganjoo & Rowlands 1998; Sibeko *et al.* 2005), and the conflicting beliefs of the benefits of breastfeeding coupled with the family, work, social and cultural context of a mother's life that discourage exclusive breastfeeding (Zimmerman & Guttman 2001). Differences between Somali study participant and other disadvantaged groups exist as well. For instance, most Somali mothers did not report the early introduction of solid foods or the use of costly commercial infant foods (Barton 2001;

Marques *et al.* 2001; Heath *et al.* 2002), instead opting to feed the children what they were eating or making baby foods themselves.

Creating a culturally informed health promotion intervention

Understanding these intersecting beliefs and practices is an important first step for creating effective, culturally informed health promotion practices. From this study, we learned that interventions should affirm that mothers are likely breastfeeding and probably supplementing with formula as well. Programmes can highlight the underlying support for breastfeeding by emphasizing the cultural and religious significance of breastfeeding for Somalis. In addition, emphasis can be placed on the protective benefits of breastfeeding from sickness and allergies, as well as its role as a natural contraceptive. At the same time, education to address mothers' concerns is needed: for example, teaching how to recognize evidence of sufficient breast milk (e.g. let down, pre-/post-weights, engorgement, adequate number of diapers) and strategies for increasing breast milk production (e.g. reduce formula supplementation, increase fluid intake, pumping). While this study provides insights into Somali beliefs and practices, providers are reminded that 'no one person speaks on behalf of any group of people' (Krueger & Casey 2000), and that each person has their own unique combination of experience and perspectives.

It is now known that decisions about what and how to feed are the result of multifaceted interactions between mothers' perceptions, level of education, economic resources and their children's nutritional status (McFadden & Toole 2006). Knowledge is not enough (Zimmerman & Guttman 2001) to change practice as mothers reduce or stop breastfeeding because of environmental and cultural pressure, while holding the belief that breastfeeding is good for their baby. In addition, Gabriel *et al.* (1986) have identified culturally held views about infant feeding. For instance, Mahon-Daly & Andrews (2002) have suggested that insufficient milk has become a cultural belief rather than a fact, which can be inadvertently reinforced by health providers who emphasize weight gain (McFadden

& Toole 2006). Findings from this research suggest primary care and other health practitioners are also an important resource for infant nutrition information in the Somali community. To improve trust and the likelihood of following advice, providers should take time to hear and address mothers' concerns, explain rationales for recommendations, empathize with their experience, repeat important guidance regularly and offer preventive advice. Study participants also advocated using Somali language materials and interpreters when needed; existing resources are available from the Food Security Analysis Unit (<http://www.fsasomali.org>) in Somalia and the Minnesota International Health Volunteers (<http://www.mihv.org>).

In developing a culturally informed health promotion intervention, it is essential to consider recent research that demonstrates the inability of 'one-size-fits-all' nutrition education interventions to address the cultural and environmental barriers that may impede obesity prevention programmes (Crawford *et al.* 2001). In accordance with the socio-ecological model for health promotion, interventions must target the multiple contexts (individual, interpersonal, community/environmental, institutional/organizational and public policy) that influence mothers' health beliefs and practices (McLeroy *et al.* 1988; Gregson *et al.* 2001). Ecological theory-based interventions situate parenting practices within the intersection of cultural values, maternal and child functioning and contextual sources of both stress and support (Black *et al.* 2001; Bronfenbrenner 1993). Guided by the socio-ecological model and study findings, the authors are currently targeting Somali mothers' interpersonal (doctor-mother) and institutional (medical clinic) environment through a new infant feeding cultural support curriculum for health care providers. Other environmental approaches may include community-based, culturally and linguistically appropriate public health programmes (e.g. using WIC clinics already frequented by some Somali families) that provide breastfeeding education and support to the Somali community; peer counseling and support interventions (given the significance of family and friends); worksite programmes for pumping and storing breast milk; and policy changes to improve low-income mothers' access to health

care, breastfeeding support and education. These approaches match with the KAPS recommendations for support and education to mothers, their support networks and the staff that care for them (i.e. health care providers and community health workers), to educate Somali mothers about the benefits and management of breastfeeding, and support them with a welcoming breastfeeding environment (Food Security Analysis Unit, Somalia 2007).

Study findings also suggest that health providers balance practice guidelines through a culturally informed lens. Currently, many national and international organizations, including the American Academy of Pediatrics, Work Group on Breastfeeding (1997), United Nations Children's Fund (1999), American Academy of Family Physicians (2001) and the WHO (2001), recommend exclusive breastfeeding for the first 6 months of life. This recommendation needs to be balanced with the environmental realities faced by Somali immigrant communities in the USA. Early return to work, family responsibilities and limited access to breast pumps present challenges for individual mothers to exclusively breastfeed. These environmental pressures exist for many low-income immigrant and refugee communities separated from the extended family support they had in their homeland. Providers must work with Somali caregivers to tailor infant nutrition strategies that address their cultural beliefs while working within their lived environment.

Strengths and limitations

This study provides rich information in an understudied area of infant nutrition and breastfeeding beliefs and practices of Somali immigrants residing in the USA. The focus groups provided an opportunity to exchange infant nutrition and feeding knowledge, and involve Somali mothers in developing a curriculum that will directly impact their community. However, this study faced some limitations. One drawback to using focus groups is participants sometimes respond based on what other people say ('social desirability') or do not offer new ideas when there is agreement around the group ('group think') (Smithson 2000). Likewise, some ethnic minority communities may be

less likely to discuss complaints about interactions with doctors (Brach & Fraserirector 2000); whether this occurs in this community is unknown although participants did share some concerns about current practices with their health providers. In low-income, refugee populations, the lack of transportation and time available were also possible barriers to participation. These are also significant barriers to health care delivery and other services provided to this population; as in the focus groups, these issues should be addressed in designing services to ensure access to care. In the focus groups, efforts were made to hold them in familiar locations and at convenient times. Lastly, the small sample size and large proportion enrolled in WIC may limit the transferability of findings to other Somali communities.

Although all focus groups included demographically diverse participants, discussions with the Somali interpreter following one of the groups suggested that younger participants may have been influenced by having older women present (and the deferential attitude to elders supported by the Somali community). We regret not coding the transcripts with demographic information on each participant, which would have enhanced our understanding of differing opinions and practices among mother's age, time in USA, number of other children and other potentially relevant factors. Another limitation was that the informed consent process was unfamiliar to some participants; several women were initially uncomfortable with signing the consent form given negative history from their immigration experience or applying for services since arriving in the USA. Efforts were made by the interpreter to review the consent process with participants and address individual concerns directly as they arose. No subjects declined to consent to participate in the study. It is also not clear what limitations existed from using an English-speaking researcher and Somali interpreter to facilitate the focus groups, as opposed to a bilingual English- and Somali-speaking researcher. There are many unexplored aspects to this question, including the nuances of being bilingual (i.e. shared language as only one aspect of shared experience, not necessarily implying shared culture or ties to a community) and preferences of some study participants to work with researchers outside of their community

(Temple 2006), suggesting an important area for future research with this population. Finally, while study methods had multiple team members review and edit the transcripts and interpretation of results, dependability and confirmability were lessened by not having the audit trail of data analysis and interpretation repeated by an independent researcher outside of the team.

Conclusion

We chose to focus on the Somali population in this exploratory study because a significant problem with overweight exists among many Somali infants, and information on infant feeding practices was limited. This study provides important information not currently available on Somali immigrant caregivers' beliefs and practices around infant nutrition and feeding practices, and preferences regarding nutrition education and health care. Key themes about infant feeding and nutrition included an underlying cultural support for breastfeeding, a shared belief that plump babies are healthier and the tendency for early formula supplementation because of concerns about breast milk adequacy, difficulties in breastfeeding and environmental and cultural barriers. To address these contrasting beliefs and practices, Somali mothers identified provider visits with interpreters; Somali language educational materials; and advice from older, experienced family members as preferred education approaches. Providers are encouraged to emphasize listening, explaining, empathy, addressing specific concerns, repeating important information, offering preventive advice and sufficient visit time when working with Somali mothers and their infants. Study findings are currently being used to guide a culturally informed curriculum for training community-based PCPs to address infant nutrition effectively in Somali immigrant families.

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Conflicts of Interest

No conflicts of interest have been declared.

References

- American Academy of Family Physicians (2001) *AAFP Policy Statement on Breastfeeding*. American Academy of Family Physicians: Leawood, KS.
- American Academy of Pediatrics (AAP) (1998) *Pediatric Nutrition Handbook*, 4th edn. American Academy of Pediatrics: Elk Grove Village, IL.
- American Academy of Pediatrics, Work Group on Breastfeeding (1997) Breastfeeding and the use of human milk. *Pediatrics* **100**, 1035–1039.
- Anderson R., Barr P. & Edwards G. (1996) Using focus groups to identify psychosocial issues of urban black individuals with diabetes. *Diabetes Educator* **22**, 28–33.
- Arenz S., Ruckerl R., Koletzko B. & von Kries R. (2004) Breast-feeding and childhood obesity – a systematic review. *International Journal of Obesity and Related Metabolic Disorders* **28**, 1247–1256.
- Barber C.M., Abernathy T., Steinmetz B. & Charlebois J. (1997) Using a breastfeeding prevalence survey to identify a population for targeted programs. *Canadian Journal of Public Health* **88**, 242–245.
- Barton S.J. (2001) Infant feeding practices of low-income rural mothers. *The American Journal of Maternal Child Nursing* **26**, 93–97.
- Barton M. & Furrer J. (2003) Cardiovascular consequences of the obesity pandemic: need for action. *Expert Opinion on Investigating Drugs* **12**, 1757–1759.
- Baughcum A.E., Burklow K.A., Deeks C.M., Power S.W. & Whitaker R.C. (1998) Maternal feeding practices and

- childhood obesity: a focus group study of low-income mothers. *Archives of Pediatric & Adolescent Medicine* **152**, 1010–1014.
- Bennett T. (1997) Racial and ethnic classification: two steps forward and one step back? *Public Health Reports* **112**, 477–480.
- Bentley M., Gavin L., Black M.M. & Teti L. (1999) Infant feeding practices of low-income, African-American, adolescent mothers: an ecological, multigenerational perspective. *Social Science & Medicine* **49**, 1085–1100.
- Benton D. (2004) Role of parents in the determination of the food preferences of children and the development of obesity. *International Journal of Obesity and Related Metabolic Disorders* **28**, 858–869.
- Berg B. (1998) *Qualitative Research Methods for the Social Sciences*. Allyn & Bacon: Boston, MA.
- Betancourt H. & Lopez S.R. (1993) The study of culture, ethnicity, and race in American psychology. *The American Psychologist* **48**, 629–637.
- Birch L.L. & Fisher J.O. (1998) Development of eating behaviors among children and adolescents. *Pediatrics* **101**, 539–549.
- Black M.M., Siegel E.H., Abel Y. & Bentley M.E. (2001) Home and videotape intervention delays early complementary feeding among adolescent mothers. *Pediatrics* **107**, E67–E74.
- Brach C. & Fraserirector I. (2000) Agency for healthcare research and quality. Can cultural competency reduce racial and ethnic health disparities? A review and conceptual model. *Medical Care Research and Review* **57**, 181–217.
- Bronfenbrenner U. (1993) Ecological systems theory. In: *Specific Environments: Thinking in Contexts* (eds R. Wozniak & K. Fisher), pp 3–44. Erlbaum: Hillsdale, NJ.
- Carothers C. (2005) *Best Start's 3-step Counseling Strategy*. Paper presented at the meeting of the International Lactation Consultant Association 2005 Conference: Breaking the Barriers to Breastfeeding: Research, Policy and Practice: Chicago, IL.
- Cashmore E. & Jennings J. (2001) *Racism: Essential Readings*. Sage: Thousand Oaks, CA.
- Centers for Disease Control and Prevention and Health Resources and Services Administration (2001) Maternal, infant and child health: breastfeeding, newborn screening, and service systems. In: *Healthy People 2010: Objectives for Improving Health*. [cited 6 September 2008] Available at: http://www.healthypeople.gov/Document/HTML/volume2/16MICH.htm#_Toc494699668. Updated 30 January 2001.
- Chezem J., Friesen C. & Boettcher J. (2003) Breastfeeding knowledge, breastfeeding confidence, and infant feeding plans: effects on actual feeding practices. *Journal of Obstetric, Gynecologic, & Neonatal Nursing* **32**, 40–47.
- Coie J.D., Watt N.F. & West S.G. (1993) The science of prevention: a conceptual framework and some directions for a national research program. *The American Psychologist* **48**, 1013–1022.
- Crawford P.B., Story M., Wang M.C., Ritchie L.D. & Sabry Z.I. (2001) Ethnic issues in the epidemiology of childhood obesity. *Pediatric Clinics of North America* **48**, 855–878.
- Cross-Cultural Health Care Program (CCHP) (1996) Voices of the Somali Community. Profile prepared by: Toby Lewis, Basra Ahmed and Khadija Hussein. [cited 18 October 2006.] Available at: <http://ethnomed.org/voices/somali.html>
- Dietz W.H. (1998) Childhood weight affects adult morbidity and mortality. *Journal of Nutrition* **128** (2 Suppl.), 411S–414S.
- Drewnowski A. (2004) Obesity and the food environment: dietary energy density and diet costs. *American Journal of Preventive Medicine* **27** (3 Suppl.), 154–162.
- Drewnowski A. & Specter S.E. (2004) Poverty and obesity: the role of energy density and energy costs. *American Journal of Clinical Nutrition* **79**, 6–16.
- Dubois L. & Girard M. (2006) Early determinants of overweight at 4.5 years in a population-based longitudinal study. *International Journal of Obesity* **30**, 610–617.
- Dunn C., Pirie P. & Lando H. (1998) Attitudes and perceptions related to smoking among pregnant and postpartum women in low-income, multiethnic setting. *American Journal of Health Promotion* **12**, 267–274.
- Dwyer J.T., Stone E.J., Yang M., Feldman H., Webber L.S., Must A., *et al.* (1998) Predictors of overweight and overfatness in a multiethnic pediatric population. Child and Adolescent Trial for Cardiovascular Health Collaborative Research Group. *American Journal of Clinical Nutrition* **67**, 602–610.
- Etelson D., Brand D.A., Patrick P.A. & Shirali A. (2003) Childhood obesity: do parents recognize this health risk. *Obesity Research* **11**, 1362–1368.
- Ethnomed (1996) Somali cultural profile. [cited 18 October 2006] Available at: http://ethnomed.org/ethnomed/cultures/somali/somali_cp.html
- Faith M.S., Heshka S., Keller K.L., Sherry B., Matz P.E., Pietrobelli A., *et al.* (2003) Maternal-child feeding patterns and child body weight: findings from a population-based sample. *Archives of Pediatric & Adolescent Medicine* **157**, 926–932.
- Field A.E., Cook N.R. & Gillman M.W. (2005) Weight status in childhood as a predictor of becoming overweight or hypertensive in early adulthood. *Obesity Research* **13**, 163–169.
- Food Security Analysis Unit, Somalia (2007) Somali knowledge, attitude and practices study (KAPS): infant

- and young child feeding and health seeking practices. [cited 29 January 2008] Available at: <http://www.fsasomali.org/fileadmin/uploads/1226.pdf>
- Freedman D.S., Dietz W.H., Srinivasan S.R. & Berenson G.S. (1999) The relation of overweight to cardiovascular risk factors among children and adolescents: the Bogalusa Health Study. *Pediatrics* **103**, 1179–1181.
- Gabriel A., Ruben K. & Lawrence R. (1986) Cultural values and biomedical knowledge: choices in infant feeding: analysis of a survey. *Social Sciences & Medicine* **23**, 501–509.
- Ganjoo C. & Rowlands R. (1998) Breast feeding and weaning practices of urban housewives in Srinagar. *Indian Journal of Nutrition and Dietetics* **25**, 354–358.
- Gill S.L., Reifsnider E., Mann A.R., Villarreal P. & Tinkle M.B. (2004) Assessing infant breastfeeding beliefs among low-income Mexican Americans. *Journal of Perinatal Education* **13**, 39–50.
- Glaser B. & Strauss A. (1967) *The Discovery of Grounded Theory*. Aldine Publishing: Chicago, IL.
- Gorman J.R., Madlensky L., Jackson D.J., Ganiats T.G. & Boies E. (2007) Early postpartum breastfeeding and acculturation among Hispanic women. *Birth* **34**, 308–315.
- Gregson J., Foerster S., Orr R., Jones L., Benedict J., Clarke B., *et al.* (2001) System, environmental, and policy changes: using the social-ecological model as a framework for evaluating nutrition education and social marketing programs with low-income audiences. *Journal of Nutrition Education* **33** (Suppl. 1), S4–S15.
- Grummer-Strawn L.M. & Mei Z. (2004) Does breastfeeding protect against pediatric overweight? Analysis of longitudinal data from the Centers for Disease Control and Prevention Pediatric Nutrition Surveillance System. *Pediatrics* **113**, e81–e86.
- Guba E. & Lincoln Y.S. (1989) *Fourth Generation Evaluation*. Sage: Newbury Park, CA.
- Gunnarsdottir I. & Thorsdottir I. (2003) Relationship between growth and feeding in infancy and body mass index at the age of 6 years. *International Journal of Obesity and Related Metabolic Disorders* **27**, 1523–1527.
- Halldórsson A. & Aastrup J. (2003) Quality criteria for qualitative inquiries in logistics. *European Journal of Operational Research* **144**, 321–332.
- Haq A.S. (2003) *Report on Somali Diet: common dietary beliefs and practices of Somali participants in WIC nutrition education groups*. Harborview Medical Center: Seattle, WA. Edited by Christine Wilson Owens, Reviewed by Carey Jackson, Community Reviewed by Salma Musa. [cited 20 January 2007] Available at: http://ethnomed.org/ethnomed/clin_topics/nutrition/somali_diet_report.pdf
- Haynes M.A. & Smedley B.D., eds. (1999) *The Unequal Burden of Cancer: An Assessment of NIH Research and Programs for Ethnic Minorities and the Medically Underserved*. National Academy Press: Washington, DC.
- Heath A.L., Tuttle C.R., Simons M.S., Cleghorn C.L. & Parnell W.R. (2002) A longitudinal study of breastfeeding and weaning practices during the first year of life in Dunedin, New Zealand. *Journal of the American Dietetic Association* **102**, 937–943.
- Hediger M.L., Overpeck M.D., Ruan W.J. & Troendle J.F. (2000) Early infant feeding and growth status of US-born infants and children aged 4–71 months: analyses from the third National Health and Nutrition Examination Survey, 1988–1994. *American Journal of Clinical Nutrition* **72**, 159–167.
- Hedley A.A., Ogden C.L., Johnson C.L., Carroll M.D., Curtin L.R. & Flegal K.M. (2004) Prevalence of overweight and obesity among US children, adolescents, and adults, 1999–2002. *Journal of the American Medical Association* **291**, 2847–2850.
- Hesketh K., Wake M. & Waters E. (2004) Body mass index and parent-reported self-esteem in elementary school children: evidence for a causal relationship. *International Journal of Obesity and Related Metabolic Disorders* **28**, 1233–1237.
- High P., Hopmann M., LaGasse L. & Linn H. (1998) Evaluation of a clinic-based program to promote book sharing and bedtime routines among low-income urban families with young children. *Archives of Pediatrics & Adolescent Medicine* **152**, 459–465.
- Hurley K.M., Black M.M., Papas M.A. & Quigg A.M. (2008) Variation in breastfeeding behaviours, perceptions, and experiences by race/ethnicity among a low-income statewide sample of Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) participants in the United States. *Maternal & Child Nutrition* **4**, 95–105.
- Ip S., Chung M., Raman G., Chew P., Magula N., DeVine D., *et al.* (2007) *Breastfeeding and Maternal and Infant Health Outcomes in Developed Countries*. Agency for Healthcare Research and Quality: Rockville, MD. Evidence Report/Technology Assessment No. 153 (Prepared by Tufts-New England Medical Center Evidence-based Practice Center, under Contract No. 290-02-0022). AHRQ Publication No. 07-E007.
- Johnson D.B., Gerstein D.E., Evans A.E. & Woodward-Lopez G. (2006) Preventing obesity: a life cycle perspective. *Journal of the American Dietetic Association* **106**, 97–102.
- Kalies H., Heinrich J., Borte N., Schaaf B., von Berg A., von Kries R., *et al.* (2005) The effect of breastfeeding on weight gain in infants: results of a birth cohort study. *European Journal of Medical Research* **10**, 36–42.
- Krueger R.A. & Casey M.A. (2000) *Focus Groups: A Practical Guide for Applied Research*, 3rd edn. Sage: Thousand Oaks, CA.

- Kuan L., Britto M., Decolongon J., Schoettker P., Atherton H. & Kotagal U. (1999) Health system factors contributing to breast feeding success. *Pediatrics* **104**, B1–B7.
- Li C., Goran M.I., Kaur H., Nollen N. & Ahluwalia J.S. (2007) Developmental trajectories of overweight during childhood: role of early life factors. *Obesity* **15**, 760–771.
- Li R., Ogden C., Ballew C., Gillespie C. & Grummer-Strawn L. (2002) Prevalence of exclusive breastfeeding among US infants: the Third National Health and Nutrition Examination Survey (phase II, 1991–1994). *American Journal of Public Health* **92**, 1107–1110.
- Mahon-Daly P. & Andrews G.J. (2002) Liminality and breastfeeding: women negotiating space and two bodies. *Health & Place* **8**, 61–76.
- Maillet N., Melkus G. & Spollett G. (1996) Using focus groups to characterize the health beliefs and practices of black women with non-insulin-dependent diabetes. *Diabetes Educator* **22**, 39–46.
- Manfredi C., Lacy L., Warnecke R. & Balch G. (1997) Method effects in survey and focus group findings: understand smoking cessation in low SES African-American women. *Health Education & Behavior* **24**, 786–800.
- Marques N.M., Lira P.I., Lima M.C., da Silva N.L., Filho M.B., Huttly S.R., *et al.* (2001) Breastfeeding and early weaning practices in northeast Brazil: a longitudinal study. *Pediatrics* **108**, E66–E72.
- McDaniel R.W. & Bach C.A. (1994) Focus groups: a data-gathering strategy for nursing research. *Nursing Science Quarterly* **7**, 4–5.
- McFadden A. & Toole G. (2006) Exploring women's views of breastfeeding: a focus group study within an area with high levels of socio-economic deprivation. *Maternal & Child Nutrition* **2**, 156–168.
- McGarvey E.L., Collie K.R., Fraser G., Shufflebarger C., Lloyd B. & Norman O.M. (2006) Using focus group results to inform preschool childhood obesity prevention programming. *Ethnicity & Health* **11**, 265–285.
- McInnes R.J. & Chambers J.A. (2008) Supporting breastfeeding mothers: qualitative synthesis. *Journal of Advanced Nursing* **62**, 407–427.
- McLeroy K.R., Bibeau D., Steckler A. & Glanz K. (1988) An ecological perspective on health promotion programs. *Health Education Quarterly* **15**, 351–377.
- Mei Z., Grummer-Strawn L.M. & Scanlon K.S. (2003) Does overweight in infancy persist through the pre-school years? An analysis of CDC pediatric nutrition surveillance system data. *Sozial- und Praventivmedizin* **48**, 161–167.
- Mein S. & Winkleby M. (1998) Concerns and misconceptions about cardiovascular disease risk factors: a focus group evaluation with low-income Hispanic women. *Hispanic Journal of Behavioral Sciences* **20**, 192–211.
- Merewood A., Brooks D., Bauchner H., MacAuley L. & Mehta S.D. (2006) Maternal birthplace and breastfeeding initiation among term and preterm infants: a state-wide assessment for Massachusetts. *Pediatrics* **118**, E1048–E1054.
- Morgan D.L. (1997) *Focus Groups as Qualitative Research*. Sage: Thousand Oaks, CA.
- Mulford C. (2008) Is breastfeeding really invisible, or did the health care system just choose not to notice it? *International Breastfeeding Journal* **3**, 1–3.
- Murdaugh C., Russell R.B. & Sowell R. (2000) Using focus groups to develop a culturally sensitive videotape intervention for HIV-positive women. *Journal of Advanced Nursing* **32**, 1507–1513.
- Nelson J.A., Chiasson M.A. & Ford V. (2004) Childhood overweight in a New York City WIC population. *American Journal of Public Health* **94**, 458–462.
- Nevid J.S. & Maria N. (1999) Multicultural issues in qualitative research. *Psychology & Marketing* **16**, 304–326.
- Nolan L. & Goel V. (1995) Sociodemographic factors related to breastfeeding in Ontario: results from the Ontario Health Survey. *Canadian Journal of Public Health* **86**, 309–312.
- Ogden C.L., Carroll M.D., Curtin L.R., McDowell M.A., Tabak C.J. & Flegal K.M. (2006) Prevalence of overweight and obesity in the United States, 1999–2004. *Journal of the American Medical Association* **295**, 1549–1555.
- Oppenheimer G.M. (2001) Paradigm lost: race, ethnicity, and the search for a new taxonomy. *American Journal of Public Health* **91**, 1049–1055.
- Owen S. (2001) The practical, methodological, and ethical dilemmas of conducting focus groups with vulnerable clients. *Journal of Advanced Nursing* **36**, 652–658.
- Pan American Health Organization (PAHO) (2003) *37th Session of the Subcommittee on Planning and Programming of the Executive Committee*. PAHO: Washington, DC.
- del Rio-Navarro B.E., Velazquez-Monroy O., Sanchez-Castillo C.P., Lara-Esqueda A., Berber A., Fanghanel G., *et al.* (2004) The high prevalence of overweight and obesity in Mexican children. *Obesity Research* **12**, 215–223.
- Roberts C.W. (ed.) (1997) *Text Analysis for the Social Sciences: Methods for Drawing Statistical Inferences from Texts and Transcripts*. Lawrence Erlbaum Associates: Mahway, NJ.

- Rossiter J.C. (1994) The effect of a culture-specific education program to promote breast feeding among Vietnamese women in Sydney. *International Journal of Nursing Studies* **31**, 369–379.
- Rupenthal L., Tuck J. & Gagnon A.J. (2005) Enhancing research with migrant women through focus groups. *Western Journal of Nursing Research* **27**, 735–754.
- Sayer A.A., Syddall H.E., Dennison E.M., Gilbody H.J., Duggleby S.L., Cooper C., *et al.* (2004) Birth weight, weight at 1 y of age, and body composition in older men: findings from the Hertfordshire Cohort Study. *American Journal of Clinical Nutrition* **80**, 199–203.
- Scaglioni S., Agostoni C., Notaris R.D., Radaelli G., Radice N., Valenti M., *et al.* (2000) Early macronutrient intake and overweight at five years of age. *International Journal of Obesity and Related Metabolic Disorders* **24**, 777–781.
- Sibeko L., Dhansay M.A., Charlton K.E., Johns T. & Gray D.K. (2005) Beliefs, attitudes, and practices of breastfeeding mothers from a periurban community in South Africa. *Journal of Human Lactation* **21**, 31–38.
- Smith P.K., Bogin B., Varela-Silva M.I. & Loucky J. (2003) Economic and anthropological assessments of the health of children in Maya immigrant families in the US. *Economics & Human Biology* **1**, 145–160.
- Smithson J. (2000) Using and analysing focus groups: limitations and possibilities. *International Journal of Social Research Methodology* **3**, 103–119.
- Stettler N., Kumanyika S.K., Katz S.H., Zemel B.S. & Stallings V.A. (2003) Rapid weight gain during infancy and obesity in young adulthood in a cohort of African Americans. *American Journal of Clinical Nutrition* **77**, 1374–1378.
- Temple B. (2006) Being bilingual: issues for cross-language research. *Journal of Research Practice* **2**, Article M2. [cited 6 September 2008] Available at: <http://jrp.icaap.org/index.php/jrp/article/view/20/39>
- Toschke A.M., Grote V., Koletzko B. & von Kries R. (2004) Identifying children at high risk for overweight at school entry by weight gain during the first 2 years. *Archives of Pediatrics & Adolescent Medicine* **158**, 449–452.
- Trochim W.M.K. (2001) *Research Methods Knowledge Base*, 2nd edn. Atomic Dog Publishing: Cincinnati, OH.
- Twinn S. (1998) An analysis of the effectiveness of focus groups as a method of qualitative data collection with Chinese population in nursing research. *Journal of Advanced Nursing* **28**, 654–661.
- Ulin P.R., Robinson E.T. & Tolley E.E. (2005) *Qualitative Methods in Public Health: A Field Guide for Applied Research*. Jossey-Bass: San Francisco, CA.
- United Nations Children's Fund. (1999) *Breastfeeding: Foundation for a Healthy Future*. United Nations Children's Fund: New York, NY.
- US Bureau of the Census (2000) Table FBP-1. Profile of selected demographic and social characteristics. [cited 9 October 2002] Available at: <http://www.census.gov/population/www/socdemo/foreign/datatbls.html>
- US Department of Health and Human Services (US DHHS) (2000) *Healthy People 2010. 2nd ed. With Understanding and Improving Health and Objectives for Improving Health*. 2 vols. U.S. Government Printing Office: Washington, DC.
- US Department of Health and Human Services (US DHHS) (2006) *Healthy People 2010 Midcourse Review*. US Government Printing Office: Washington, DC.
- Visscher T.L. & Seidell J.C. (2001) The public health impact of obesity. *Annual Review of Public Health* **22**, 355–375.
- Walker P.F. & Jaranson J. (1999) Refugee and immigrant health care. *Medical Clinics of North America* **83**, 1103–1120.
- Wang Y. & Zhang Q. (2006) Are American children and adolescents of low socioeconomic status at increased risk of obesity? Changes in the association between overweight and family income between 1971 and 2002. *American Journal of Clinical Nutrition* **84**, 707–716.
- Watters C. (2001) Emerging paradigms in the mental health care of refugees. *Social Science & Medicine* **52**, 1709–1718.
- Weine S.M., Raina D., Zhubi M., Delesi M., Huseni D., Feetham S., *et al.* (2003) The TAPES multi-family group intervention for Kosovar refugees: a feasibility study. *Journal of Nervous and Mental Disease* **191**, 100–107.
- Werner L. (2005) *Somali Women's Breastfeeding Practices and Preferences: Focus Group Findings from the Somali Health Care Initiative (SHCI)*. Minnesota International Health Volunteers. [cited 20 January 2007] Available at: <http://www.mihv.nonprofitoffice.com/vertical/Sites/%7B39D93924-66F7-4895-89B2-CF36165444EF%7D/uploads/%7BB2DCA046-67B7-4947-80C9-D35620A1279D%7D.PDF>
- Whitaker R.C. (2004) Predicting preschooler obesity at birth: the role of maternal obesity in early pregnancy. *Pediatrics* **114**, e29–e36.
- WIC Program Data (2004) Prevalence of overweight in infants seen for 6- or 12-month nutrition assessment visit at Harborview Medical Center and Columbia Health Center WIC clinics for Somali infants. July through September 2004. Unpublished data.
- Wilkinson R. & Marmot M. (eds) (2003) *Social Determinants of Health: The Solid Facts*, 2nd edn. World Health Organization: Copenhagen. Available at <http://www.euro.who.int/document/E81384.pdf>
- Williams J., Wake M., Hesketh K., Maher E. & Waters E. (2005) Health-related quality of life of overweight and obese children. *Journal of the American Medical Association* **293**, 70–76.

- Wilson A.C., Forsyth J.S., Greene S.A., Irvine L., Hau C. & Howie P.W. (1998) Relation of infant diet to childhood health: seven year follow up of cohort of children in Dundee Infant Feeding Study. *British Medical Journal* **316**, 21–25.
- World Health Organization (WHO) (2001). *Fifty-fourth World Health Assembly. Global Strategy for Infant and Young Child Feeding. The Optimal Duration of Exclusive Breastfeeding*. World Health Organization: Geneva.
- Young S.A. & Kaufman M. (1988) Promoting breastfeeding at a migrant health center. *American Journal of Public Health* **78**, 523–525.
- Zimmerman D.R. & Guttman N. (2001) 'Breast is best': knowledge among low-income mothers is not enough. *Journal of Human Lactation* **17**, 14–19.