Original Article

A focused ethnographic assessment of Middle Eastern mothers' infant feeding practices in Canada

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Abstract

The aim of this study was to examine the barriers to following complementary feeding guidelines among Middle Eastern mothers and the cultural considerations of practitioners from an emic perspective. This is a two-phase focused ethnographic assessment of infant feeding among 22 Middle Eastern mothers in Western Canada who had healthy infants aged <1 year. Data were collected through four focus groups conducted in Arabic/Farsi, and were further complemented by comprehensive survey data collected in the second phase of study. Mothers' main criterion for choosing infant foods was whether or not foods were Halal, while food allergens were not causes for concern. Vitamin D supplements were not fed to 18/22 of infants, and mashed dates (Halawi), rice pudding (Muhallabia/Ferni) and sugared water/tea were the first complementary foods commonly consumed. Through constant comparison of qualitative data, three layers of influence emerged, which described mothers' process of infant feeding: socio-cultural, health care system and personal factors. Culture was an umbrella theme influencing all aspects of infant feeding decisions. Mothers cited health care professionals' lack of cultural considerations and lack of relevance and practicality of infant feeding guidelines as the main reasons for ignoring infant feeding recommendations. Early introduction of pre-lacteal feeds and inappropriate types of foods fed to infants among immigrant/refugee Middle Eastern mothers in Canada is cause of concern. Involving trained language interpreters in health teams and educating health care staff on cultural competency may potentially increase maternal trust in the health care system and eventually lead to increased awareness of and adherence to best practices with infant feeding recommendations.

Keywords: Middle East, infant feeding, immigrant, refugee, Canada, health care practitioners.

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Introduction

Canada welcomed over 280 000 newcomers in 2010, and one in every five Canadians was an immigrant, making up 19.8% of the total population in 2006 (Statistics Canada 2005, 2006). Over the past few decades, there has been an influx of Middle Easterners into Canada, and it is estimated that by 2017, the population of new-settler West Asians and Arabs will

increase by 150% and 118% to reach 276 000 and 423 000, respectively (Statistics Canada 2006).

Newcomers often lack access to the host country's resources and welfare support programmes, and may be viewed as 'undeserving foreigners' (Ferguson *et al.* 2005). Such newcomers are often marginalised within the new country due to the racial, language and cultural differences, and this particularly affects vulnerable groups such as women and children.

Culture embraces a range of learned human behaviours that are transmitted between generations through the socialisation and enculturation practices (Leininger 1990). Given that culture encapsulates shared beliefs and values, and immigration from the Middle East to Canada is increasing, it is essential that health care professionals, from Canada and other jurisdictions with similar immigration patterns, learn more and incorporate these cultural considerations in the care they provide to this emerging group.

Traditionally, most Middle Eastern mothers breast-feed their infants for a prolonged period of time before and after migration to a Western country (Ghaemi-Ahmadi 1992), but they also typically introduce solid foods that may be harmful to infants, which may jeopardise infant health outcomes (Al-Nasser *et al.* 1991). Maternal beliefs, behaviours and psychosocial characteristics are potentially the most important modifiable factors influencing mothers' infant feeding decisions (Losch *et al.* 1995). However, no previous study has evaluated cultural beliefs of Iranian and Arab mothers with respect to timing of the introduction of complementary foods and the types of foods fed to infants or cultural considerations relevant to health care practitioners from an emic perspective. An emic perspective is important because the descriptions and accounts provided by the participants may be regarded as meaningful from the standpoint of the culture being studied (Pelto & Pelto 1978). It is imperative that practitioners understand cultural practices so that they are more able to provide quality health care services to individuals from diverse backgrounds (Baumann 2009).

The aims of this study were to examine Arab and Iranian refugee/immigrant mothers' experiences, perceptions and cultural norms that shape complemen-

tary feeding practices and their actual infant feeding practices after settlement in Canada, and the cultural considerations of health care professionals.

Methods

This study was approved by Women & Children's Health Research Institute (WCHRI) and Health Research Ethics Board at the University of Alberta, Canada. This study was a focused ethnography which is used to understand a small part of a larger issue and it frequently uses interviews and/or focus groups for data collection (Morse & Field 1995). Focused ethnography is conducted with a specific intent or topic for data collection and has the advantage of collecting large amounts of information in a short period of time (Knoblauch 2005).

Before data collection began, the purpose and procedures of this research were presented and explained to mothers, and all mothers signed the informed consent forms, which were provided in mothers' own native languages as well as in English. We assured mothers that the data would be presented in such a manner that they would not be personally identifiable and encouraged them to discuss each other's opinions and to understand that there was no right or wrong answer to the questions.

Participants were recruited from community agencies in Edmonton (Western Canada) via flyers and word of mouth. Participation was restricted to adult mothers (≥ 18 years) who were born and raised in the Middle East and had healthy infants aged less than 1 year. A total 22 mothers (6 Iranian, 4 Iraqi, 6 Kuwaiti and 6 Saudi Arabian) participated in this research.

Key messages

- Middle Eastern mothers' strong commitment to breastfeeding is a result of their Islamic beliefs, while their early introduction of solids is rooted from cultural traditions and personal misbeliefs.
- Participants in this study cited health care professionals as the sole sources of infant feeding information accessible to them in Canada. This suggests that clinicians should learn how to provide immigrant mothers with the required information in a culturally appropriate manner.
- Delivering holistic health care to Middle Eastern mothers requires cultural competency to recognise and respect differences between belief systems and to be responsive to the challenges that mothers may face.

Concurrent data collection and analysis were performed using an ethnographic design in order to identify the cultural background of complementary feeding practices among Middle Eastern refugees/immigrants in Canada (Schmoll 1987). As the knowledge gained in ethnography is emic in nature, our data yielded a rich understanding of mothers' experiences of infant feeding from their own points of view (Field & Morse 1985).

Data collection and analysis

Focus group discussions

According to Krueger & Casey (2000), focus group (FG) data should be collected up to the point where no new themes or topics are mentioned by participants (usually three focus groups) and topics are saturated. To ensure topic saturation, we conducted four FGs (each including 4–6 participants) and efforts were made to discuss all topics in each focus group; when new themes or topics emerged, we asked the opinion of the whole group, as well as the participants in the consecutive focus groups (Reed & Payton 1997). During the third and the fourth focus groups in this research, discussions were around the same topics discussed in the first two focus group discussions and, as a result, we completed our data collection and analyses using four focus groups.

FGs were conducted at a time that did not interfere with Muslims' five daily prayers, and because none of these new-settler mothers were fluent in the English language, the bilingual principal investigator (M.J.) and a facilitator conducted all discussions in participants' respective languages (Farsi and Arabic) to maximise data quality (Twinn 1998). Open-ended FG questions were constructed based on the review of literature, consultation with faculty members and infant feeding experts (including Health Canada's nutrition advisors), and input from community members. The FG guide was piloted to ensure clarity among five Middle Eastern mothers, who were not included in the main study. Generally, a flexible approach was taken during the focus groups ensuring that mothers directed the discussions and not the researchers (Wilkinson 1998).

FGs were audio-taped and transcribed verbatim in Arabic and Farsi soon after the session was over in order to preserve their linguistic authenticity (Richards & Morse 2007). Pseudonyms were used throughout to ensure anonymity of participants.

Thematic analysis was performed independently by the researcher and facilitator whereupon data were analysed line by line to highlight words/phrases that captured the emerging issues. These words/phrases were categorised into meaningful clusters and were further refined and agreed upon by the research team. Finally, patterns and relationships between categories were identified and the main themes were synthesised, which described the experience of complementary feeding among Middle Eastern mothers. Field notes, analytical memos and interaction data were also analysed using congruent methodological approach (Duggleby 2005).

Survey

In order to fully understand the social living context of mothers and their families in ethnic Muslim communities, this qualitative ethnographic study was complemented by survey data collected at the end of each FG session. Data were collected on socio-demographic characteristics, health status and infants' growth patterns using pre-tested questionnaires of the Alberta Pregnancy Outcomes and Nutrition (APrON) study (see <http://www.apronstudy.ca> for further details; APF is a co-investigator of this cohort study). In addition, comprehensive information on breastfeeding and formula feeding practices, timing of introduction and intake frequencies of liquid/solid foods, supplement intakes and main sources of infant feeding information were collected. Weight and height were self-reported in this study.

Questionnaires, consent forms and recruitment posters were translated into Farsi and Arabic and were back-translated into English by bilingual researchers and community leaders of Middle Eastern mothers for ensuring reliability. Quantitative survey data were analysed by simple descriptive statistics using Statistical Software for the Social Sciences, version 18.0 (SPSS Inc., Chicago, IL, USA,

2009), and due to the small number of participants from each ethnicity, subgroup analysis was not performed.

For evaluating infants' growth patterns, *z*-scores of weight and length at birth and at current age were calculated using the World Health Organization (WHO) Anthro software (WHO Anthro for Personal Computers, version 3.2.2 2011). The WHO Anthro is a widely used software for monitoring growth and development among individuals and populations aged 0–60 months based on the WHO Child Growth Standards (WHO Multicentre Growth Reference Study Group 2006). In addition, percentiles of birthweight for gestational age were calculated according to the Canadian population-based reference charts (Kramer *et al.* 2001).

Results

Quantitative findings

The median (interquartile range) age of participants was 25.50 (10.0) years, and except for one mother who was widowed, others were married. All mothers followed Islamic religion, and over three-quarters had a high school education or less ($n = 17$). Nineteen mothers had an annual household income of less than \$39 000 Canadian dollars and most were unemployed ($n = 15$) or self-employed ($n = 5$) (data not shown). Infants' age ranged from 3 to 11 months and based on the WHO standard growth charts, the mean (SD) birthweight *z*-score was -0.058 (0.077), while the mean (SD) of length *z*-score at birth was $+0.17$ (0.08) (Table 1). Between birth and the time of this study, weight/length *z*-scores decreased significantly by 39.26% and 5.4%, respectively.

At the time of study, all mothers were breastfeeding except for one, who was medically exempted due to the contraindication of prescription drugs with breastfeeding (Table 2). Two infants received formula to compensate for breast milk insufficiency and nine were fed formula milk only at the hospital. Overall, none of the mothers were exclusively breastfeeding (i.e. only breast milk and medications) due to the initial formula milk introduced at hospitals, current formula feeding practices or early introduction of

Table 1. Characteristics of Middle Eastern infants in an ethnographic study in Canada*

Characteristics	Values
Male infants, <i>n</i>	12/22
Birthweight for gestational age percentile, <i>n</i>	
3–5th	1/22
5–15th	8/22
15–50th	10/22
50–75th	1/22
75–95th	2/22
Weight <i>z</i> -score at birth, mean (SD)	-0.058 (0.077)
Percentage change in weight <i>z</i> -score from birth, mean (SD)	39.26 (52.75) [†]
Length <i>z</i> -score at birth, mean (SD)	0.17 (0.08)
Percentage change in length <i>z</i> -score from birth, mean (SD)	5.4 (21.3) [†]

SD, standard deviation. *Birthweight for gestational age percentiles were calculated using the population-based Canadian reference developed by Kramer *et al.* (2001); and weight and length *z*-scores were determined using the World Health Organization Anthro software (WHO Anthro for personal computers, version 3.2.2 2011).

[†]Negative change.

solid foods and liquids. All participants reported avoidance of feeding foods that were not Halal (Arabic word meaning 'permitted') to infants, while only six noted food allergens as a feeding concern. A vitamin D supplement was not given to 18/22 infants due to its high cost and not being a priority for the mothers.

The first foods commonly fed to infants were mashed dates (Halawi), followed by rice pudding (Muhallabia/Ferni) and sugared water/tea (Table 3). As presented in Fig. 1, none of the infants were fed soy milk, evaporated milk and other milk (e.g. rice milk, almond milk and hemp milk). On average, infants were fed sweet drinks at the median age of 8.8 weeks, followed by breakfast cereals at 12 weeks, goat's milk at 13.6 weeks, water at 13.92 weeks and sweet foods at 15.32 weeks.

Qualitative findings

Middle Eastern mothers identified several barriers to following infant feeding recommendations which we categorised as (1) socio-cultural; (2) health care system; and (3) personal factors.

Table 2. Infant feeding practices of Middle Eastern mothers in an ethnographic study in Edmonton, AB, Canada

Characteristics	<i>n</i>
Any breastfeeding	
Breastfeeding from birth and still continuing to do so	21/22
Breastfeeding from birth but have stopped	1/22
Reason for stopping breastfeeding	
Drug interaction (physician's advice)	1/22
Any formula feeding	
Introduced formula and still continuing to do so	2/22
Introduced formula but have stopped	9/22
Never introduced formula	11/22
Timing of introduction of formula	
Not yet introduced	11/22
First day at hospital	9/22
Before 3 months post-partum	2/22
Reasons for stopping formula feeding	
Did not like to feed artificial milk	7/22
High cost of formula	2/22
Exclusive breastfeeding	0/22
Reasons to avoid feeding some types of foods*	
Not being Halal (e.g. pork, alcohol, gelatin and meat not slaughtered ritually) [†]	22/22
Grandmother's advice	1/22
Baby's lack of interest	3/22
Food allergy	6/22
Types of foods avoided for infants*	
Non-Halal [†]	22/22
Egg	3/22
Nut	1/22
Oat	1/22
Vitamin/mineral supplementation [‡]	
Vitamin D	18/22
None	4/22
Methods of infant feeding	
Bottle	7/22
Sippy cup without valve	1/22
Open cup	14/22
Person responsible for preparing infants' foods	
Mother	22/22
Main sources of infant feeding information	
Grandmother	9/22
Grandmother and relatives	9/22
Previous experience	4/22

*Subjects chose more than one option and therefore categories are not mutually exclusive. [†]Although not included in the original questionnaire of the Alberta Pregnancy Outcomes and Nutrition (APrON) study, this category was added by mothers themselves. [‡]Note: In the Middle East unlike Canada, breastfed infants are not recommended to take vitamin D supplements since birth.

Table 3. Complementary foods introduced to the Middle Eastern infants in an ethnographic study in Edmonton, AB, Canada

Complementary feeding	<i>n</i>
First complementary foods introduced	
Mashed dates (Halawi)	6/22
Rice pudding (Muhallabia/Ferni/Harire badam)	5/22
Sugared water/tea	5/22
Rice water	4/22
Butter (ghee) and sugar	1/22
Rice dessert (Roz-belhalib/Shir-berenj)	1/22
Timing of introduction of table foods	
Not yet introduced (<6 months)	3/22
12 weeks	1/22
16 weeks	6/22
18 weeks	4/22
20 weeks	6/22
22 weeks	1/22
24 weeks	1/22

Barriers to infant feeding guidelines

Socio-cultural barriers

Cultural and religious beliefs were the most important factors that hindered Middle Eastern mothers from following complementary feeding recommendations. For instance, dates were an inseparable part of infants' diets and is one of the first foods being introduced given the emphasis of Islamic beliefs on consumption of this food and maternal beliefs in their health benefits. Mothers regularly fed herbal infusions to infants to prevent or treat colic and they prepared sweet drinks and desserts as part of a routine cultural tradition. Middle Eastern mothers believed in 'hot' and 'cold' theory and thought that infants should be frequently fed sweet treats in order to avoid gastrointestinal problems, which are caused by the 'cold' nature of breast milk and table foods:

Maryam: 'Since birth I have always fed her [infant] mint water. Specifically, if I eat legumes or something flatulent then I am sure my milk would cause her colic . . . So I sweeten some water with Nabat (candy with saffron) and add a little mint water to it and feed her. This is what my mother has taught me and it works!' (FG 1)

Zohreh: 'Yes mint water is really good . . . I started with rice water, "harireh badam" and "ferni" (rice puddings) when she

Fig. 1. Age of introduction of liquids and solid foods to the Middle Eastern infants in an ethnographic study in Edmonton, AB, Canada.

was 1.5 months old and then shifted to other foods slowly . . . I add some water to our table foods and mash it with spoon so she can have it easily.'

Mothers mostly attributed their complementary feeding practices to religious beliefs:

Ayesha: 'The reason why we feed sweet foods since birth is that we want babies to taste sweet as the first flavour based on our Islamic teachings . . . I feed dates to my baby every-day; I just put some water with 3 or 4 dates in a pot and cook it and then mash it with a fork.' [Mashing pre-cooked dates with fork while speaking] (FG 2)

In one focus group, early introduction of table foods was justified as follows:

Aliyah: 'Anything that you eat will affect your milk. In Persian Gulf countries we consume lots of spicy foods and because it goes into breast milk some babies develop small rashes in the beginning, but I think babies get used to it after some time and that is why they could tolerate lots of spices afterwards . . . Arabs I mean.' (FG 2)

Razan: 'Absolutely . . . we believe that if mothers consume a variety of foods and flavours, babies will be less fussy because they would be exposed to different flavours and would tolerate the foods more easily.'

Sabriyah: 'Sometimes it's like trial and error . . . I gave my baby an ethnic food the other day and she threw it up and I was so frustrated and told myself: "I am not going to give her that food until later."'

Some mothers noted that despite living far away from home, previous infant feeding experiences gained in their home countries as well as advice from friends and relatives back home have influenced their infant feeding decisions:

Mahdiyyah: 'My mother recommended feeding him [infant] lentils cause it is energetic and has iron; so I fed him that from 4 months and alhamdulillah [praise to Allah] he did not have any problems with it.' (FG 2)

Sabriyah: 'I get my information from my sister in Kuwait who has a baby as old as mine . . . she told me to start with fresh and natural foods, so I started with yogurt, rice and stews and he tolerates them well . . . so of course no restriction, we feed babies whatever we eat and if I were in Kuwait I had too many other options like camel and goat milk.'

Among social/community barriers to following complementary feeding guidelines, the stigma of breastfeeding in public places, lack of nursing rooms and high cost of infant formula influenced these Muslim mothers to feed solid foods to infants from an early age whenever going outside home. Although they felt dissatisfied with not being able to breastfeed, being ashamed of exposing their bodies in public hindered breastfeeding.

Health care system barriers

Several aspects of health care policy and health care team practices were identified as potential barriers to conforming to the infant feeding guidelines, including discrepancies between complementary feeding guidelines offered by different sources (e.g. brochures, physicians and nurses), lack of culturally appropriate resources in mothers' own languages, high costs of dietary supplements/prescription drugs and impractical infant feeding brochures (e.g. suggesting food recipes that required expensive kitchen appliances).

Generally, most mothers received contrary advice from different brochures and resources:

Mehri: ' . . . Some [brochures] are provided by nurses, some by physicians and some I was given by an occupational therapist; and surprisingly, each of them says something different and contrary. For instance, one says: "Do not feed infants tomatoes and strawberries", while others do not say so.' (FG 1)

Zohreh: 'I never use brochures; they are all in English and the foods are so unfamiliar to me.'

Discrepancies were also noted between health care professionals' advice. Mothers were concerned about not receiving common health messages:

Mahshid: 'My physician told me that from 5 months of age, I should breastfeed him first and then give him some foods; while the nurse said first foods then breast milk! [laughs] . . . how can we trust them? it is so different because if I give him table foods first he would not take enough milk afterwards.' (FG 1)

[Everyone agree]

Negar: 'One of the nurses told me to avoid citrus fruits and fruits with red color like tomatoes and strawberries. She said the color itself causes allergy. However, other nurses thought that it was not true and I could feed her anything! They [nurses] even have conflicts among themselves!'

Maryam: 'You see! If we were in our country we had at least the advice of friends and family, but here clinicians are our only sources of information, and it means so much to us.'

Participants strongly believed that brochures and clinicians' advice lacked cultural and religious relevance:

Aliyah: 'What they [clinicians] offer does not work for us from the Middle East; we would be better our own way of infant feeding . . . we like to feed our babies home-made natural foods and not those cereals and powders that factories make from whatever.' (FG 2)

Ayesha: 'I think it is because Western mothers look for easy food, like jar foods, no matter the price; that is why physicians also recommend them . . . However, they should know that we prefer to cook ourselves, we do not have such stuffs in the Middle East [jar foods].'

Mothers' lack of language proficiency was another barrier to using health care resources:

Sakina: 'They gave me a food guide in Arabic, but nothing about baby foods . . . If they really want us use hotlines and brochures they should provide them in our languages; otherwise, we have to seek information from elsewhere.' (FG 2)

Razan: 'Yes, if there were representatives of our culture in clinics, then we could confidently explain our concerns in Arabic and get help from them immediately.'

Another problem with infant feeding resources was that their recipes required various kitchen utensils and appliances that were not accessible to newcomer mothers. By not having blenders and mixers, mothers avoided feeding foods with hard textures (such as commonly consumed lamb meat).

Summayah: 'We have just come to Canada and mixers and blenders are not priorities of our lives . . . I do not have all the things that these recipes require so I use bottom of a fork to mash foods . . . I have a pot to cook foods in it and that suffice.' (FG 3)

Zahara: 'Also, as refugees we really do not know what is going to happen, I mean if we are going to stay or go back; so we prefer not to spend money on home appliances and ignore what is not essential.'

Health care staff were blamed for not providing multiparous mothers with enough information on infant nutrition, assuming that they already have the knowledge and experience from their previous children:

Negar: 'When I asked the physician what to feed my baby he replied: "absolutely everything" . . . as I was leaving his office I remembered from my previous child in Iran that

there were some food restrictions for infants under one year. So I asked him if it was okay to give him eggs and he said: "no!", and I asked about cow's milk and he replied: "no!", and about honey, and he said: "no!". I was even more frustrated when he told me: "this is your second child so I assumed you already knew these." ' (FG 1)

Mehri: 'What if the recommendations were different between the countries?'

Maryam: 'Do they expect us to remember everything from previous children?'

Finally, clinicians' lack of awareness of differences in infant feeding guidelines between the countries could potentially jeopardise the health of the new-comer ethnic groups in Canada:

Hila: 'For my previous children in Iran, I was told to give iron supplements from 6 months but in Canada they said that it is not necessary, I wonder what to do.' (FG 1)

Mehri: 'I think their [Canadian] infant formula and foods have iron in them.'

Negar: 'But I only give breast milk and home-made foods.'

Mehri: 'Honestly I do not know. I also asked the nurse and she said it [iron supplements] is not necessary.'

Personal barriers

Maternal characteristics such as personal beliefs and values, economic level and employment status were among the most important individual barriers to adherence to complementary feeding recommendations. Lack of knowledge and experience as well as personal misbeliefs led these young Middle Eastern refugee/immigrant mothers to introduce table foods to their infants at an early age, holding the belief that home-made foods were healthy and infants had to get used to them. Water was introduced during the first few weeks due to the maternal belief that it was safe since it was also included in the liquid formulas that hospitals offered:

Ayesha: 'I would like to grow him natural and so I feed him everything . . . when he was about 3 months old I gave him some of our dinner and he really liked it . . . I believe that as

soon as babies get their teeth they are allowed to have anything.' (FG 2)

Aliyah: 'Unfortunately, my baby does not eat eggs and fish which are good for the baby, he is 7 months now and should be able to chew but he just does not like the smell ...'

In addition, mothers refrained from feeding infant cereals and commercial baby foods, and instead preferred home-made foods as the former was unfamiliar and expensive. Of concern was also the maternal belief that Middle Eastern infants prefer Middle Eastern foods rather than the Western foods (e.g. cereals):

Zohreh: 'My son does not like infant cereals at all. I have seen many mothers from the Gulf countries having the same problem; our infants do not like the Western foods [laughs]. ... In the beginning I gave him a little bit of oat but it caused him severe rashes all over the body and we had to take him to hospital emergency unit ... my husband was so mad at me that I had violated our feeding traditions.' (FG 1)

Hila: 'I agree ... Have you noticed how Western people like cheese? Their kids are also crazy for that ... I work in a day care and I have never had a problem feeding Canadian infants cheese or cereals; but oh! my own son ... I still have problems feeding him the breakfast.'

Mahshid: 'It is because in Iran we normally have sweetened tea, fresh cheese, walnuts and flat bread for breakfast, which children really like. But here [in Canada] they feed babies milk and cereals and we are not used to that ... when you see all those vitamins written on a cereal package, you think that it is better than our traditional foods while it is not really; it just costs more.'

Maryam: 'There is something about the taste. Actually, once I tasted the cereal and ough it was gross [changes her facial expression]. ... I throw it all out!'

This notion was also supported enthusiastically in another focus group:

Hadeeqa: 'Prepared baby foods are not necessary at all, you could make the same things at home ... it is much cheaper, safer and babies like it. Afterall this is the way we were fed ourselves.' (FG 3)

Shafia: 'She [infant] likes our Arabic foods with all the spices in them [laughs]. I think that is because she has tasted these flavours through my milk and now she is used to them.'

Zahara: 'For me it is cheaper to make her Roz-Belhalib (rice dessert) which only needs rice, milk and sugar ... I serve it as the main meal to feed all my kids ... my husband also likes it!'

[Everyone confirms]

Being concerned about infants' weight gain was also cited as a reason for early introduction of foods:

Taibah: 'My daughter gained lots of weight in the first 2 months and then her weight went down so I had to do something about it ... First I decided to feed her formula but if you depend on it [formula] you will have to pay \$30 for a week. So instead I tried homo-milk in addition to Halawi (dates) and alhamdulillah [praise to Allah] she recovered.' (FG 4)

Poverty experienced by these mothers was an important barrier to practicing proper complementary feeding practices. All mothers were dissatisfied with the high costs of recommended dietary supplements and prescription drugs and some avoided giving them to their infants for this reason:

Hila: 'My son is diagnosed with anemia and his iron drop costs over \$16 which is just too much for us ... Canada has a system called "child health benefits" by which you could receive assistance from the government based on your last year's income ... This is not fair, we worked day and night last year so my husband could go to university and we could have a baby this year so we earned \$35 K last year, but they say the cut-off is \$34 K. We have applied twice for child benefits and have been rejected, so we just cannot afford the supplements all the time.' (FG 1)

Negar: '... I always wonder why the government does not subsidise the vitamin D supplement cost. If we were in the Middle East, we would not need to buy it because there is too much sun ... High cost is the main reason for not buying it [vitamin D supplement].'

In another focus group, mothers explained their coping strategies:

Parveen: 'It [vitamin D supplement] costs \$15 for one bottle and it is just the third of the way full; they don't even fill the

whole bottle I do not know why . . . Because it is summer now and the sun is out, I take him [baby] to the sun instead of giving him supplements, it is more affordable.' (FG 3)

Shafia: 'Yes right, I do that as well.'

Hadeeqa: 'It is not logical to pay that much for 19 drops, especially since our babies need 2 drops a day because of their skin colors . . .'

When mothers compared the supplement/medication costs in Canada with those in their own countries, significant differences were revealed:

Zohreh: 'Supplements are extremely expensive here [in Canada]. In Iran, vitamin D costs only 0.5 dollar and it is provided free of charge to babies by vaccination staff, although it is not an obligatory supplement there. Last week I had to pay \$17 for D-drops which is too much.' (FG 1)

Although employed Muslim mothers continued breastfeeding, food and drinks predominated their infants' diets. Concern about lack of provision of Halal foods in day care per day homes was another problem:

Summayah: 'My husband's income as a taxi driver does not cover all our living expenses, so I need to work as well . . . the problem is that we do not have someone to leave the children with so I take my infant to a day home but I am afraid that they feed him something with gelatin or ham, which are not Halal.' (FG 3)

Parveen: 'Yes, they do not care what the babies eat as long as they eat something.'

Summayah: 'I asked the day home manager not to feed him anything . . . they would not, if they are ethical.'

Parveen: 'You know, kids like to eat each other's foods and they [day home managers] let them do . . . I have seen this many times, you can never trust them.'

Employed mothers also cited the low quality of meals offered in day cares per day homes as another barrier to proper infant feeding practices:

Raja: 'It is really annoying that they [day cares per day homes] charge you so much for food, and what they actually feed infants are mashed potatoes and pre-packed soups . . . their menu says that they offer tuna sandwich and chicken

noodles but I doubt if they ever do . . . In any case, their food is not Halal.' (FG 4)

Zumurrud: 'Yes, and they serve deli meat and turkeys with lots of salt which I think are not healthy.'

Wafa: 'Alhamdulillah [praise to Allah] I have asked a Muslim sister in the day home to have an eye on my infant and not to let him have pork and meat . . . The other day my child came home crying cause all the other kids had been given deli turkey and toast except for him . . . I could not explain to him why; this is also hard for children to be always the exceptions.'

Discussion

Cultural traditions and personal beliefs were umbrella themes influencing all aspects of infant feeding decisions among this group of Middle Eastern mothers. Mothers' strong commitment to breastfeeding was a result of their Islamic beliefs, while their early introduction of solids was rooted in their cultural traditions and personal misbeliefs.

Delivering holistic and culturally relevant health care to Middle Eastern immigrant/refugee mothers requires cultural competency by health care practitioners to recognise and respect differences between belief systems and cultural values, and to be responsive to the challenges that these mothers face. The process of immigrating to a new country and establishing a new life presented many difficulties for these mothers. Some of the problems they experienced were exacerbated by the fact that their fundamental beliefs and values differed from those that dominated in Canadian society. Muslims' commitment to religion and their belief in cultural traditions are deep-rooted, requiring health care professionals to have some basic understanding of their knowledge and cultural beliefs.

Traditional foods were fed to infants at the median age of 2 weeks, and the order in which different foods were introduced was not in line with the Canadian infant feeding recommendations (Canadian Paediatric Society, Dietitians of Canada, and Health Canada 2010). Similar findings were reported by a recent study which showed that Middle Eastern mothers in Australia have the highest breastfeeding

rates on discharge compared to mothers with other ethnic origins, although their exclusive breastfeeding rates at 6 and 12 weeks post-partum were low (Dahlen & Homer 2010). It has been suggested that promotion of breastfeeding in Islamic teachings positively influences breastfeeding rates (Gatrad 1994). However, Muslims' strict adherence to religious beliefs, such as consuming only Halal foods, decreases their available choices for infant feeding and might jeopardise their infants' health. Muslims do not consume alcohol, pork and meat that is not ritually slaughtered, or foods that are contaminated with these products (e.g. gelatin, hard cider, collagen, fermented malt, lard, pepsin and vanilla extract), while many of the commercial infant foods contain some of these items. As a result, Muslim migrant mothers are often limited to feeding certain sweet foods, such as custard and puddings due to having limited choices, which in the long-term could result in nutritional inadequacies and tooth decay (Gatrad 1994).

Interestingly, the types of foods that mothers in this study introduced to their infants were the same as those commonly consumed in the Middle East. Most mothers from the Persian Gulf countries have high breastfeeding duration and low rates of exclusive breastfeeding, rarely exceeding 1 month (Musaiger 1996). They often feed their infants ghee (melted clarified butter), dates, honey and water from the first days of life, and glucose and herbal water during the first week in the belief that they are colic relief (Musaiger 1996; Imani *et al.* 2003; Rahimzadeh *et al.* 2007). In the Middle East, infants are commonly fed ghee during the first 3 days of life so their bodies are strengthened and their intestines are lubricated and sanitised (Musaiger 1990). Despite the high median of breastfeeding duration (22 months) in Iran (Rahimzadeh *et al.* 2007), only about half of infants are fed complementary foods in the order recommended by health authorities (Imani *et al.* 2003). Previous studies have shown that as many as 53% of Iranian infants are fed sugary water between 0 and 1 month of age (Rostaminezhad & Amani 2004). A similar pattern has also been observed in United Arab Emirates (UAE) where the prevalence of feeding water increased from 70% in week 1 to 82% in week 4 and that of yansun (herbal infusion) increased from

9% to 18% during the same period (Al-Mazroui *et al.* 1997). In addition, the rates of feeding tea and Babunj (local herbal drink) in UAE increase from 5% and 3% in week 1 to 9% and 5% in week 4, respectively (Al-Mazroui *et al.* 1997).

Overall, Middle Eastern culture seems to have a negative impact on breastfeeding exclusivity by promoting early introduction of solids. Previous studies conducted in the Persian Gulf have indicated high rates of early solid introduction (Musaiger 1996). In Arabic countries, fruits, vegetables, muhallabia (rice pudding), yogurt and eggs are normally introduced at 3–5 months of age. By 6–8 months, babies are fed almost all food items, especially starchy foods (staples) such as rice, bread, potatoes and some meat, poultry and legumes (El-Sayed 1985). As an Islamic ritual, shortly after birth, a small piece of softened date is rubbed on infants' palate (practice of 'Tahnik'). By this ritual, the taste of sweetness, and not ingestion of date or foods, is sought, which should be understood by health care professional to alleviate parental concerns (Shaikh & Ahmed 2006; Pak-Gorstein *et al.* 2009).

Another cause for concern among Middle Eastern refugees/immigrants was their lack of vitamin/mineral supplementation due to poverty and the high cost of the supplement. Lack of vitamin D supplementation is concerning, especially in Canada where infants are at risk of vitamin D deficiency and insufficiency (Health Canada 2004). Particularly, Muslim mothers who cover their bodies and are not exposed to sunlight and their breastfeeding infants are at increased risk and need more attention in this regard (Guzel *et al.* 2001; Seeler 2001). The higher requirement for vitamin D of dark-skinned Middle Eastern children coupled with the high cost of this supplement represented the main barriers to supplementation in this study. The development of policies such as subsidising part of the supplements' costs may prove to be beneficial.

Another important issue among this group of Muslim mothers was their infants' impaired growth as reflected in slow growth rates. The negative changes in weight and height z-scores since birth among these infants suggest that environmental factors (such as diet) may play significant roles in growth pattern of

these vulnerable children. However, because the subjects in the present study were not followed up for a period of time, we are unable to provide specific information as to when the steep drop occurred in this sample. Previously, issues such as pre-lacteal feeding, unhygienic preparation of foods and inappropriate food choices have been reported among mothers from Persian Gulf countries, which are suggested to be the reason behind their infants' faltered growth (Musaiger 1990). Our findings are also in line with those of a previous study in the Middle East which showed growth decline in infants during the first year of life, especially among those who were fed complementary foods (fruit juice and meat) earlier than 4 months of age, although this is contraindicated by Canadian guidelines (Shidfar *et al.* 2008). Shidfar *et al.*'s study also suggested better growth outcomes among infants who were introduced egg yolk at a proper age (6–8 months) (Shidfar *et al.* 2008).

This study has several strengths; firstly, no previous study has assessed Middle Eastern mothers' complementary feeding practices after migration to a Western country from an emic perspective. In addition, conducting and analysing FGs in the mothers' own local languages by bilingual researchers increased data quality and enabled us to analyse data with more sensitivity. Self-reported rather than direct measurement of height and weight for mothers and infants is a limitation of this study.

There is an urgent need for the development of educational strategies targeting complementary feeding practices among Muslim Middle Eastern immigrant/refugee mothers. By increasing health care professionals' knowledge and awareness of infant feeding behaviours of ethnic mothers and recognising their cultural beliefs and practices would lead to culturally competent care. Delivering culturally competent health care requires the ongoing efforts and commitments of practitioners and organisations to work effectively within the cultural context of clients (i.e. community, family and individual) (Campinha-Bacote 2007). According to the 'Process of Cultural Competence in Delivery of Health Care Services model', health care staff should provide culturally relevant care to multi-ethnic groups through five main model constructs of cultural awareness

(analysing one's own values, biases and prejudices), cultural knowledge (seeking and obtaining information on different cultural groups), cultural skills (accurately performing a culturally based patient assessment which includes clients' linguistic needs), cultural encounters (engaging in cross-cultural interactions with clients) and cultural desire (Campinha-Bacote 2007). The final construct, cultural desire, requires that practitioners be motivated to want to, rather than have to, get involved in the process of becoming culturally aware and skillful and be familiar with cultural encounters. To have cultural desire, one must respect differences and learn willingly from others as cultural informants (Campinha-Bacote 2007).

The growing diversity of the Canadian population and its complexities calls for cultural responsiveness in order to ensure and nurture diversity in the health care system. It is also recommended that common messages are offered to mothers by the health care team to avoid inconsistencies and mothers' mistrust. Health care professionals should also be more cautious in transferring infant feeding recommendations to mothers of different ethnicities and should practice cultural competency to gain mothers' trust. Incorporating trained language interpreters in health care system and in-service education of clinicians on cultural competency might also be beneficial in increasing health care use among immigrants/refugees and ensure a democratic society. After all, cultural competency is a moral and ethical obligation in diverse societies such as Canada.

Finally, specifying more financial resources (e.g. subsidies, loans and coupons) to new-comer Middle Eastern families might reduce the financial burden of their large families and help them meet the infant feeding recommendations more effectively.

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Conflicts of interest

The authors declare that they have no conflicts of interest.

Contributions

This study is based on part of a M.Sc. thesis submitted by MJ to the University of Alberta, Canada. MJ conceptualized the study, conducted the focus groups, analysed the data and drafted the manuscript. APF guided and supervised the study and assisted in interpretation of findings and finalizing the manuscript. KO helped with designing the study and data analyses and provided professional comments.

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