

Infant feeding in Saudi Arabia: mothers' attitudes and practices

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تغذية الرُّضَع في المملكة العربية السعودية: مواقف الأمهات وممارساتهن

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الخلاصة: أجرى الباحثون تقصيًّا وطنياً شمل جميع القطاعات في عينة من 4872 أمًّا (غالبية من السعوديات) لدراسة أنماط تغذية الرُّضَع لديهن. وتم جمع المعلومات عن ممارساتهن في تغذية أصغر أطفالهن عن طريق استبيانات سابقة الاختبار. وبيّنت الدراسة أن أربعة أخماس الأمهات تلقين تنقيفاً صحياً عن الإرضاع من الثدي، معظمه على يد العاملين الطبيين، وكانت الأمهات الأصغر سناً أكثر حصولاً على هذه المعلومات. وتبين أن 92٪ من الأمهات يرضعن اللبن للولدان، ولكن 76.1٪ من الأمهات لجأن إلى الإطعام من الزجاجاة بعد 3 أشهر (حيث أفاد 48.3٪ منهن بأن سبب ذلك هو عدم كفاية لبن الأم). ولوحظ ترابط يُعْتَدُّ به إحصائياً بين استخدام الزجاجاة وبين جنسية الأمهات ومستوى تعليمهن. وكانت التغذية المختلطة شائعة أيضاً (الإرضاع من الثدي مع الإطعام من الزجاجاة). ولوحظ أيضاً أن تقديم الأغذية الصلبة للرُّضَع بدأ في مرحلة متأخرة، وأن هناك ترابطاً يُعْتَدُّ به إحصائياً بين تقديم الأغذية الصلبة وبين جنسية الأم وعمرها ومستوى تعليمها. وتتشابه هذه النتائج مع نتائج دراسات سابقة على السعوديات، مما يدل على عدم تغير أنماط تغذية الرُّضَع، وعلى تفضيل الإطعام المبكر من الزجاجاة والفظام المتأخر، مما يعني ضرورة تشجيع الأمهات على الاقتصار على إرضاع أطفالهن من الثدي لمدة 6 أشهر، وعلى البدء بإعطائهم الأغذية الصلبة في الوقت المناسب.

ABSTRACT We conducted a nationwide cross-sectional survey of 4872 mothers (mostly Saudi) to study infant feeding patterns. Information was collected about their feeding practices with their youngest child using pre-tested questionnaires. About four-fifths of the mothers had received health education about breastfeeding, most often from medical staff; younger mothers tended to be better informed. Approximately 92% fed colostrum to the newborn, but 76.1% had introduced bottle-feeding by 3 months (48.3% cited insufficient milk as the reason for introducing the bottle). This was significantly related to nationality and education level. Mixed feeding (breastfeeding and bottle-feeding) was popular. Solid foods tended to be introduced late and this was significantly related to nationality, age and education level.

L'alimentation du nourrisson en Arabie saoudite : attitudes et pratiques des mères

RÉSUMÉ Nous avons réalisé une enquête transversale nationale auprès de 4872 mères (pour la plupart saoudiennes) pour étudier les modes d'alimentation du nourrisson. Des informations ont été recueillies sur les pratiques d'alimentation de leur enfant le plus jeune au moyen de questionnaires prétestés. Près des quatre cinquièmes des mères avaient reçu une éducation sanitaire concernant l'allaitement au sein, le plus souvent dispensée par le personnel médical ; les jeunes mères avaient tendance à être mieux informées. Environ 92 % ont donné le colostrum au nouveau-né, mais 76,1 % avaient introduit l'allaitement au biberon à l'âge de 3 mois (48,3 % ont invoqué l'insuffisance de lait comme justification de l'allaitement au biberon). Ceci était significativement lié à la nationalité et au niveau d'instruction. L'allaitement mixte (allaitement au sein et au biberon) était populaire. L'alimentation solide avait tendance à être introduite tardivement, ce qui était lié significativement à la nationalité, à l'âge et au niveau d'instruction.

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Introduction

The importance and necessity of breastfeeding are well established. In Saudi Arabia the law is based on the Quran and the Hadiths, or the sayings of the Prophet Muhammed ﷺ. The Quran instructs its followers to breastfeed children for 2 complete years, saying: *The mothers shall give suck to their offspring for two whole years for him who desires to complete the term. But he shall bear the cost of their food and clothing on equitable terms (2:233).*

The World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) recommend that all mothers breastfeed their babies exclusively for 6 months and then continue breastfeeding along with offering complementary foods up to the second year of life or later [1,2]. Optimally, solids would not be offered to infants before 6 months of age and bottle-feeding would be unnecessary.

A considerable number of studies have been carried out in Saudi Arabia looking at infant feeding practices [3–26]. Most have shown that infant feeding among mothers in the country is less than optimal. Many efforts are being made to promote breastfeeding in Saudi Arabia. The government and various nongovernmental organizations are actively promoting the most natural and safest method of infant feeding. Meanwhile, commercial establishments are working to improve the sale and consumption of breast milk substitutes. They often give free samples to new mothers and their marketing schemes can be very aggressive. The result is that infant feeding practices are constantly changing in our community [4–6].

We aimed to assess infant feeding patterns in a cross-sectional survey of Saudi and non-Saudi mothers throughout the country. This information will be useful to revise ongoing programmes and to devise new strategies to promote breastfeeding.

Methods

We conducted a cross-sectional study of 4872 mothers throughout Saudi Arabia from July 2002 to June 2003. The sample included both Saudi and non-Saudi nationals. Participants were selected from both government and private hospitals and were interviewed with a pre-tested questionnaire to collect demographic data, their opinions about breastfeeding and their feeding practices for their last child. Half the maternity and children's hospitals in the country were selected. Women were recruited from outpatient clinics and depending on attendance and the number of women required, every third or fourth woman was selected. Pregnant women and women without a hospital record were excluded. Few declined to participate. The questionnaire was devised by staff in the Nutrition Department of the Ministry of Health and it was pretested on a group of women in Riyadh. The interviews were conducted by trained nurses, midwives and dieticians.

We looked for trends in the responses by classifying the mothers according to various demographic characteristics. They were divided into 4 education groups: those with no schooling (illiterate) and those who received some primary school, some high school and some university education. Mothers were also divided into 4 age groups: younger than 20 years, 20–29 years, 30–39 years and 40 years and older. As regards employment, housewives and unemployed mothers were considered one group and students and employed mothers another group. We had 3 groups defined by family situation: mothers living in a nuclear family, those living with the extended family and others (e.g. living alone).

We enquired about the women's main source of health education with 5 options: medical staff, relatives, mass media, school

education and manufacturers of infant formulas. Mothers were asked whether or not they breastfed the infant early so that he/she could get the colostrum. We also asked the age of child when introduced to bottle-feeding and solid foods.

Data were analysed with *Epi-Info*, version 6.04.

Results

Table 1 shows the demographic characteristics of the mothers. Most were from the Central and the Eastern regions of Saudi Arabia and most (81.5%) were Saudi nationals. Over one-fifth (23.1%) of the mothers had not received any schooling and were illiterate, although 30.7% and 28.9% had some primary and high school education respectively, and 17.3% of mothers had gone to university. Half (51.7%) were in the third decade of life and 27.3% were employed or were students.

Over one-fifth (22.2%) of the mothers had not received any health education about breastfeeding (Table 2). Medical personnel were the major source of the mothers' education about breastfeeding; 44.9% of mothers had received information from them. Relatives were the source of information for 26.8% of the mothers.

There was a significant difference between the Saudis and the non-Saudis in terms of breastfeeding education; fewer Saudi mothers than non-Saudi mothers had received health education ($P \leq 0.05$). The age of the mothers was significantly related to whether or not they received health education; fewer mothers over age 40 years had received health education than their younger counterparts ($P \leq 0.01$). Education level was also related to receiving health education. Significantly more university-educated mothers had received

Table 1 Demographic characteristics of the mothers

Demographic characteristic	No.	%
<i>Region (n = 4872)</i>		
Central	1239	25.4
North	1008	20.7
South	566	11.6
East	1240	25.5
West	819	16.8
<i>Nationality (n = 4811)</i>		
Saudi	3922	81.5
Non-Saudi	889	18.5
<i>Education (n = 4802)</i>		
Illiterate	1111	23.1
Primary School	1473	30.7
High School	1387	28.9
University	831	17.3
<i>Age (years) (n = 4827)</i>		
< 20	401	8.3
20–30	2498	51.7
30.1–40	1650	34.2
> 40	278	5.8
<i>Employment status (n = 4812)</i>		
Housewife or unemployed	3499	72.7
Student or employed	1313	27.3
<i>Type of family (n = 4805)</i>		
Nuclear family	3382	70.4
Extended family	1191	24.8
Other	232	4.8

Data were missing for some women in certain categories.

health education than illiterate mothers ($P \leq 0.01$) (Table 3).

The majority (88.6%) thought that colostrum was good for the infant and only 1.2% thought it was harmful. Over 90% of mothers suckled their babies to allow them the colostrum. Education was significantly related to giving colostrum with significantly more educated mothers allowing their infants colostrum ($P \leq 0.05$). More mothers who lived with in a nuclear family

Table 2 Sources of mother's health education/information about breastfeeding^a

Source	No. (n = 3791) ^a	%
Medical staff	1702	44.9
Relatives	1019	26.8
Media	673	17.8
School	352	9.3
Infant formula companies	45	1.2

1081/4872 (22.2%) of the mother had not received any education/information about breastfeeding.

^aThere were 2 women who did not mention the source of their information.

also allowed their infants the colostrum than mothers living with their extended families ($P \leq 0.01$) (Table 3).

About three-quarters of the mothers (76.1%) introduced bottle-feeding within 3 months of birth. Significantly more Saudis did so than non-Saudis ($P \leq 0.05$) and more university-educated mothers introduced bottle-feeding than illiterate mothers ($P \leq 0.01$) (Table 3).

Approximately half of the mothers (48.3%) said that they introduced bottle-feeding because they did not have enough milk (Table 4). Absence, because of work or education, were the reasons given by 18.3% of mothers. New pregnancy was the reason given by 13.2% of the mothers for starting early bottle-feeding (Table 4).

Solid foods were introduced by half (50.0%) of the mothers when their baby was 4–6 months of age; 33% of mothers started

Table 3 Maternal characteristics compared with maternal practices

Maternal characteristics	Mothers who received health education	Mothers who gave colostrum to the newborn	Mothers who introduced bottle-feeding within 3 months
	No. (%)	No. (%)	No. (%)
Total	3793 (78.3)	4307 (91.9)	3426 (76.1)
<i>Nationality</i>			
Saudi	3020 (77.3) ^{a**}	3474 (92.0)	2828 (78.3) ^{b*}
Non-Saudi	727 (81.9) ^a	782 (91.0)	565 (67.6) ^b
<i>Age (years)</i>			
< 20	315 (78.8) ^c	318 (85.9)	236 (73.8)
20–30	2033 (81.8) ^c	2187 (91.3)	1741 (76.6)
30–40	1268 (77.1) ^c	1517 (93.7)	1236 (77.4)
> 40	149 (53.6) ^{c**}	254 (94.1)	188 (67.9)
<i>Education</i>			
Illiterate	740 (67.3) ^d	953 (88.3) ^e	773 (71.8) ^f
Primary	1151 (78.4)	1301 (91.3)	1028 (73.9)
Secondary	1152 (83.2)	1239 (93.9)	1004 (79.9)
University	697 (84.2) ^{d**}	762 (94.4) ^{e*}	589 (85.6) ^{f**}
<i>Type of family^g</i>			
Nuclear family	2688 (79.9)	3083 (94.0) ^{h**}	2365 (74.9)
Extended family	897 (75.6)	990 (73.3) ^h	935 (78.1)

^{b,e*} $P < 0.05$ ^{a,c,d,f,h**} $P < 0.01$.

^gOthers were excluded because of the small number.

Table 4 Mothers' reasons for introducing early bottle-feeding

Reason	No.	%
Not enough milk	1719	48.3
Mother's absence	652	18.3
Mother became pregnant	469	13.2
Illness ^a	408	11.5
Other	312	8.8
Total	3560	100.1

^aIllness of either the mother or child.

giving solid foods after the infant was 6 months of age. Significant differences were observed between Saudi and non-Saudi mothers regarding the infant's age at introduction of solid foods ($P \leq 0.05$) (Table 5). Young maternal age was also significantly related to the early introduction of solid

foods ($P \leq 0.05$) as was education level (Table 5) ($P \leq 0.05, \leq 0.01$).

Discussion

It is encouraging to note that around four-fifths of the population had received some health education about breastfeeding and that medical personnel were the source for half of them. In a study in 2003 in a university hospital in western Saudi Arabia, only 56% of women had had any health education about infant feeding and most of their information had come from relatives [4]. Prior formal education was related to health education about breastfeeding and the younger generation was more informed than older women. Despite an apparent increase in the percentage of mothers receiving health education about breastfeeding,

Table 5 Relationship between the age of the infant when solid foods were introduced and various maternal variables

Maternal characteristic	Age of the infant when introduced to solid foods			
	< 2 months No. (%)	2-4 months No. (%)	4.1-6 months No. (%)	> 6 months No. (%)
Total	50 (1.1)	715 (15.9)	2248 (50.1)	1471 (33.0)
<i>Nationality</i>				
Saudi	45 (1.2) ^{a*}	589 (16.2)	1770 (48.7) ^b	1228 (33.8) ^c
Non-Saudi	5 (0.6) ^a	126 (14.8)	478 (56.1) ^{b*}	243 (28.5) ^{c*}
<i>Age (years)</i>				
< 20	10 (3.1) ^{d*}	47 (14.5)	159 (49.1)	108 (33.4)
20-30	22 (1.0) ^d	383 (16.7)	1132 (49.3)	761 (33.1)
30-40	15 (0.9) ^d	243 (15.1)	819 (51.0)	528 (32.9)
> 40	3 (1.1) ^d	43 (15.7)	141 (51.5)	87 (31.8)
<i>Education</i>				
Illiterate	16 (1.5)	178 (16.8)	475 (45.0) ^e	387 (36.7) ^g
Primary	14 (1.0)	231 (16.5)	661 (47.1) ^f	497 (44.4) ^h
Secondary	13 (1.0)	181 (14.2)	667 (52.4)	412 (32.4) ^g
University	6 (0.8)	128 (17.2)	444 (59.5) ^{f*, e **}	168 (22.5) ^{g*, h**}
<i>Residence</i>				
Nuclear family	33 (1.0)	495 (15.6)	1638 (51.6)	1006 (31.7)
Extended family	14 (1.3)	195 (17.9)	500 (46.0)	379 (34.8)

* a,b,c,d,f,g $P < 0.05$; e,h ** $P < 0.01$.

there is and will remain a need for health education programmes to disseminate information about breastfeeding. Many other surveys have also stressed the need for a campaign to promote breastfeeding [5,6,8,9,12,14,16,17,22].

Because health education has improved, approximately 9 in 10 mothers knew that colostrum was good for infants and gave it to their baby. Significantly more mothers living in a nuclear family gave colostrum than mothers who lived with an extended family. This may indicate that established feeding practices are still prevalent and perpetuate through the generations.

The majority of mothers in our study breastfed their infants. Other studies have found the same [4–14] although most indicate lower rates of exclusive breastfeeding ranging from 10.8% to 50%.

In our study, bottle-feeding was introduced early and 76.1% of mothers began bottle-feeding within 3 months of birth. This is contrary to the recommendations of infant feeding of WHO. More Saudis introduced bottle-feeding early than non-Saudis. The affluence of the Saudis may explain this behaviour. Furthermore significantly more university-educated mothers introduced bottle-feeding early than illiterate mothers. This may be because educated mothers were outside the home more often than illiterate mothers and thereby felt they needed to introduce bottles earlier.

Mixed feeding with breast and bottle is the most popular method of infant feeding in Saudi Arabia [8,14–24]. Mixed feeding rates have been reported to range from 16.5% in a national survey in 1995 to 59.4% in Riyadh in 1998. Also in Riyadh, the mean age (standard deviation) for starting bottle-feeding was 1.84 (2.49) months and bottle-feeding was introduced significantly earlier to girls than to boys [20].

In our study, insufficient breast milk was the commonest reason for the early introduction of bottle-feeding which is similar to other studies [4,6,8,9,12,13,16,18,19,22–24]. In some studies, contraceptive usage was also a common reason for introducing bottle-feeding as but this was not a reason given in our study. Breast milk is thought to be harmful to a child when the mother was pregnant or using contraceptives. Further probing is required to understand how the mothers determined that their infants were receiving insufficient milk.

A review of the literature indicates that mothers in Saudi Arabia tend to introduce bottle-feeding early and solid foods late [4,6–8,10,14,15,17,18,20,22,23,25,26]. Our study complements the previous body of research. In our study, only 17.0% of mothers introduced solid foods early, or before their infants were less than 4 months of age. Half of the mothers started solid foods between 4 and 6 months and almost one-third started after 6 months of age. Education significantly and positively affected behaviour: educated mothers started giving solid foods to their infants earlier than illiterate or less educated mothers. Saudi mothers more often than non-Saudi mothers significantly delayed giving solid foods to their infants. A few mothers under 20 years of age introduced solid foods too early (< 2 months) which may indicate a lack of knowledge of young mothers about the inappropriateness of solid foods for such small infants.

Earlier studies have shown that mothers in Saudi Arabia introduce bottle-feeding too early and our study indicates that this practice is continuing. Bottle-feeding is not necessary for the infant, but often mothers started feeding their babies with the bottle believing that their breast milk is insufficient. There is a need to reassure mothers that breast milk supplies all the nutritional

requirements of the infant up to the age of 6 months. Their doubts should be dispelled through media and individual counselling and they should be encouraged to continue. Since approximately half of the women received breastfeeding information from health personnel, training professionals to tackle this problem is recommended.

Another problem that has been reported in previous studies is late and improper weaning. Again this problem was still

evident in our study. Information about breastfeeding is provided during antenatal check-ups and support for breastfeeding is already given at the time of delivery. After the birth of the child the contact between the mother and the health worker is often lost or becomes minimal and this may be a reason for late and improper weaning. A strategy should be devised to educate mothers to wean their infants properly and to help them accomplish this.

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