

Complementary feeding patterns in a developing country: a cross-sectional study across Lebanon

M. Batal,¹ C. Boulghourjian² and C. Akik²

أنماط التغذية التكميلية في أحد البلدان النامية: دراسة للمقطع العرضي شاملة في لبنان

مالك بطل، شوغيك بلجرجيان، شذى عتيق

الخلاصة: تقدّم هذه الدراسة الأولى من نوعها من حيث طيفها الواسع حول التغذية التكميلية في لبنان تحليلاً حول توقيت وأنماط الطعام الذي يقدم للرضع وفقاً للخصائص الديموغرافية والاجتماعية والاقتصادية للأمهات وللرضع. وقد وجدت دراسة مسح للمقطع العرضي على مدى 10 شهور أن معظم الأطفال قدم لهم أطعمة صلبة في الشهر الرابع من العمر أو بعد ذلك. وقد لوحظ أن عدداً كبيراً من الرضع كانوا يعطون السوائل إلى جانب رضاعة الثدي أو مستحضرات الحليب التي تعطى في وقت سابق. كما لوحظ أن النساء اللاتي يعملن خارج المنزل يغلب أن يعطين أولادهن أطعمة صلبة قبل سن 4 شهور بمقدار الضعف تقريباً. وقد كان أشيع الأطعمة التي يبدأ بإعطائها الحبوب. ويستهلك أكثر من نصف الأطفال أطعمة نشوية وفواكه كل يوم، وليس اللحوم والسمك.

ABSTRACT This first, large-scale study on complementary feeding in Lebanon analysed the timing and types of food introduced to infants according to mothers' demographic and socioeconomic and infants' characteristics. A cross-sectional survey over 10 months found that the majority of infants were introduced to solid foods at or after 4 months of age. A large number of infants were given liquids other than breast or formula milk earlier. Women in employment outside the home were almost twice as likely to introduce solid foods before age 4 months. The most common starting food was cereals. More than half the children consumed starchy foods and fruits every day, but not meats and fish.

Alimentation de complément dans un pays en voie de développement : une étude transversale au Liban

RÉSUMÉ Cette première étude à grande échelle sur l'alimentation de complément, menée au Liban, analysait le moment d'introduction et le type de nourriture proposé aux nourrissons en fonction des caractéristiques démographiques et socio-économiques de la mère et des spécificités du nourrisson. Une étude transversale menée sur 10 mois a montré que chez la majorité des nourrissons, les aliments solides étaient introduits à partir de l'âge de quatre mois ou au-delà. Un grand nombre de nourrissons était alimenté avant quatre mois avec des liquides autres que du lait maternel ou du lait pour nourrissons. La probabilité que les femmes ayant un emploi en dehors de la maison introduisent des aliments solides avant l'âge de quatre mois était près de deux fois supérieure. Le plus souvent, les premiers aliments introduits étaient les céréales. Plus de la moitié des enfants consommait des féculents et des fruits chaque jour ; par contre, ils ne mangeaient ni viande, ni poisson.

¹Nutrition Program, Faculty of Health Sciences, University of Ottawa, Ottawa, Ontario, Canada.

²Department of Epidemiology and Population Health, American University of Beirut, Beirut, Lebanon (Correspondence to M. Batal: malek.batal@uottawa.ca).

Received: 24/05/07; accepted: 13/11/07

Introduction

Debate about the optimal duration of exclusive breastfeeding led the World Health Organization to carry out a systematic review in 2002 in which the authors concluded that 6 months is the ideal period [1]. Furthermore, there is consensus on the types of foods recommended for the transition from breast milk/formula to solid foods, with the majority of studies concurring that young children require foods that are energy- and nutrient-dense as opposed to thin gruels that can hinder the absorption of certain micronutrients [2].

Mothers in the developing world, however, are at risk of following inaccurate guidelines and misinformation. High rates of morbidity and poor growth and stunting more often than not have been attributed to poor weaning practices [3–5]. Although these morbidities have been reported for Lebanon as well [6], and some reports on feeding-related ailments have been published, such as the prevalence of diarrhoea and gastro-oesophageal reflux, no studies have examined their causes in relation to the types and quantities of foods provided to the very young child. Despite the high infant and under-5 morbidity rates due to feeding problems in Lebanon—58.0% infant morbidity in the greater Beirut area [7]—complementary foods and feeding practices have not been given sufficient systematic consideration and there is very little documented information on these issues.

Lebanon has a total estimated population of 3 677 778 within an area of 10 452 km². The infant mortality rate is 27.4 per 1000 live births and life expectancy is 71.8 years. The economy of Lebanon is recuperating from 15 years of civil war, which has led to a reduced *per capita* income [8].

This is the first, large-scale and extensive report on complementary feeding practices in Lebanon to identify the

patterns of introduction of solid foods, the demographic, socioeconomic and infant characteristics influencing these practices, and the types of complementary foods provided to infants and young children in Lebanon.

Methods

Study sample

Two-stage sampling was conducted to select participants. Out of the 80 health centres operated by the Ministry of Social Affairs receiving patients of low to middle socioeconomic status, a random sample of 20 health centres was selected. Mothers who visited the health centres on the day the research team was there and who met the criteria for inclusion were randomly recruited to participate in the research. Inclusion criteria were: having a last child between 1 and 5 years of age (index child) and gestational age at birth ≥ 37 weeks.

A total of 1000 participants were randomly selected; 17% were excluded due to incomplete questionnaires and refusal to participate. Chi-squared tests were performed and no significant differences were found between these women and the participants.

Data collection

The survey was administered over 10 months in 2003–04. All interviews were conducted by dietitians trained in standard data collection techniques and ensured that all sociodemographic questionnaires were completely filled in. The aim of the study was explained and consent was requested from all mothers before interview. Information on all variables was collected at the health centres.

Questionnaire design

The questionnaire included 9 sections: (i) information about all children in the family: number, sex and how many were breastfed; (ii) information about the index child (born 1–5 years ago): age, sex, place of birth, who attended

the birth, type of delivery, use of analgesics, height and weight of child at birth; (iii) information about breastfeeding patterns for the index child: timing of first breastfeeding, period of exclusive breastfeeding, other liquids given to the infant, timing of introduction of solid foods, source of advice for introduction of solid foods, duration of breastfeeding, reason for termination of breastfeeding; (iv) hospital delivery practices related to breastfeeding: liquid first given to infant postdelivery, hospital influence on this choice, provision of formula milk in the hospital, provision of information while in the hospital about benefits of breastfeeding and methodology, encouragement by hospital staff to breastfeed within the first half hour post-delivery, rooming in, number of visits per day of infant to mother (in case of no rooming in); (v) the perceived benefits of and barriers to breastfeeding; (vi) the social encouragement to breastfeed from spouse, mother, mother-in-law, obstetrician/gynaecologist and paediatrician; (vii) patterns of introduction of solid food, including age and food frequency questionnaire; (viii) general information about the mother such as age, height, weight, nationality, religion, place of birth, place of residence, marital status, educational level, occupational status and whether the mother herself was breastfed; (ix) other demographic information such as education level and occupation of the father. Information from sections (i)–(iii) and (vii)–(ix) were used in this analysis.

The food frequency questionnaire recorded mother's recall of the frequencies of certain categories of food consumed by infants (cereals, fruits, dessert, dairy, vegetables, eggs, meat, legumes): every day; 4–6 times per week; 2–3 times per week; 1 time per week; seldom; never.

The questionnaire was pilot tested prior to the initiation of interviews, and changes were made accordingly. The validity and reliability of the questionnaire

was examined with test–retest (Cronbach $\alpha = 0.78$), inter- ($\kappa = 0.83$) and intra-rater ($\kappa = 0.82$) reliabilities.

Statistical analysis

For statistical analysis SPSS, version 12.0 was used and all analyses were performed and reported by 1 person who had not been involved in data collection. The chi-squared statistic was used for testing the significance of cross-tabulations. Student *t*-tests were conducted for calculating mean differences. Non-parametric 1-way analysis of variance was performed to rank scores of the food frequency questionnaire with selected variables, and the Kruskal–Wallis test of chi-squared approximation was used to explain significant differences in the analysis. Multivariate logistic regression analysis was done to evaluate the associations between the infant's age at initiation of complementary feeding and maternal, childbirth and infant data. A dichotomous dependent variable was used by categorizing the infant's age at initiation of complementary feeding as < 4 months of age and \geq 4 months of age, because at the time the study was carried out, the recommendations for introduction of solid foods were between 4 and 6 months [1]. The odds ratio (OR) and the 95% confidence interval (CI) for each independent variable were derived through regression analysis. An OR was considered significant if the 95% CI did not include 1.

Results

Maternal and child characteristics

The characteristics of the study group are given in Table 1. The mean age of mothers was 30.8 years and their mean number of children was almost 5. Almost all mothers were of Lebanese nationality and married. Many had less than high school education (53.6%) and the great majority were homemakers.

Table 1 Characteristics of the study group of infants and mothers (n = 830)

Characteristic	No. of responses	Value
Infants		
Sex (%)	825	
Boys		52.4
Girls		47.6
Mean (SD) birth weight (g)	803	3314 (588)
Mean (SD) birth height (cm)	526	50.7 (2.9)
Mothers		
Mean (SD) age (years)	829	30.8 (5.9)
Mean (SD) nonpregnancy weight (kg)	781	64.0 (11.7)
Mean (SD) height (m)	595	1.6 (0.1)
Mean (SD) no. of children	830	4.9 (1.6)
Nationality (%)	830	
Lebanese		99.2
Marital status (%)	827	
Married		99.2
Education status (%)	829	
Primary or less		19.9
Intermediate		33.7
High school		23.4
University		20.9
Other		2.1
Employment status (%)	828	
Homemaker		77.3
Employed		2.2
Other		20.5
Place of birth (%)	704	
Urban		56.0
Rural		44.0
Place of residence (%)	704	
Urban		47.8
Rural		52.2

SD = standard deviation.

The mean birth weight of the index child was 3314 g. Almost all mothers gave birth in a hospital (92.5%). For 88.6% a physician was present to assist with the delivery. Delivery was by caesarean section in 22.9% of women, and 44.1% stated that they had been given analgesics during and/or immediately following the delivery.

Breast feeding practices

More than half (55.9%) of the mothers reported that they initiated breastfeeding their babies within a few hours of

birth, 18.3% within half an hour, and 21.2% a few days after birth; 4.6% of the sample did not breastfeed. A large number of mothers reported that physicians (42.8%) or their own mothers (22.0%) influenced their decision to breastfeed. Other sources of influence included: relatives (11.0%), mother-in-law (10.0%), the media (7.0%) and books (7.1%).

More of the mothers who exclusively breastfed for the first 6 months of life were born in a rural than in an urban region (57.1% versus 30.0%) ($\chi^2 = 10.86$,

$P = 0.012$) and more were currently residents of rural areas (63.4% versus 32.4%) ($\chi^2 = 10.29, P = 0.006$). Overall, termination of breastfeeding was due to mother's belief that breast milk was insufficient for the infant (26.2%) or belief that the child was old enough (21.0%).

Introduction of complementary foods: age and frequency

The majority of infants in the study received solid foods at or beyond 4 months of age (Table 2). The proportion of infants introduced to solid foods below the recommended age was not large; the largest proportion were given cereals (9.1%), followed by fruits (7.8%) (Table 3). However, a large number had been given other fluids such as sweetened water and herbal teas (Table 4). Table 3 also shows that just over 5% of infants were given dairy and desserts below the recommended age.

Mothers who initiated breastfeeding early did not differ from those who initiated later with regard to age of weaning. However, those who breastfed longer, i.e. for more than 6 months, introduced cereals at a significantly later age [mean 6.7 (SD 5.5) months] than those who breastfed ≤ 5 months [mean 5.9 (SD 4.2) months] ($t = -2.05; P = 0.041$). Weaning onto other food groups was similar comparing the 2 breastfeeding groups.

Mean age of weaning was significantly different for all food groups when analysed by place of residence. Interestingly, for all food groups, mothers residing in urban areas initiated complementary foods earlier than those in rural areas (Table 5). Maternal place of birth, education level and employment status were other factors that significantly influenced the introduction of solid foods for some food groups (Tables 5 and 6). Mothers in employment outside the home introduced complementary foods at significantly younger ages than did homemakers. The mean age of weaning

Table 2 Age of infants at introduction of solid foods (n = 827)

Age at introduction of solid foods	No.	%	95% CI	Cumulative %
< 3 weeks	4	0.5	0.01-1.0	0.5
> 3 weeks and < 2 months	26	3.1	2.0-4.3	3.6
> 2 and < 4 months	151	18.3	15.6-20.9	21.9
At 4 months	344	41.6	38.2-45.0	63.5
At 5 months	93	11.3	9.1-13.4	74.7
At 6 months	111	13.4	11.1-15.8	88.2
> 6 months	98	11.9	9.6-14.1	100.0

CI = confidence interval.

to solid food was also lower for mothers with higher levels of education.

Most of the mothers in the study (64.5%) gave their children baby food every day; only 15.4% said that they never gave their children baby food. More than half the children were eating fruit (55.4%), bread (57.1%) and biscuits (52.0%) every day. Other foods given every day were *kaak* (a kind of cracker-bread that is readily available in Lebanon) (28.5%), desserts (17.8%) and honey (13.3%). The frequency of consumption of meats was relatively low, with 32.1% of the children never having beef, 21.8% never having chicken, 61.5% never having lamb, and 50.8% never having fish.

The food frequency data were subjected to 1-way analysis of rank scores to assess the distribution of foods consumed in the rural versus urban regions. Place of residence was chosen since for all food groups weaning age differed significantly between the 2 regions. The

results revealed that children from urban areas consumed more of the following foods: fruit ($P = 0.006$), potatoes ($P < 0.001$), carrots ($P < 0.001$), peas ($P < 0.001$), spinach ($P < 0.001$), squash ($P < 0.001$), green beans ($P < 0.001$), rice ($P = 0.048$), baby food ($P = 0.008$), beef ($P = 0.002$), chicken ($P < 0.001$), *muhlabiyeh* (a Lebanese milk-based dessert) ($P < 0.001$) and *mughli* (a rice powder-based dessert) ($P = 0.01$). Children residing in rural areas consumed more *bulgur* (cracked wheat) ($P < 0.001$), yogurt ($P = 0.013$) and other dairy products ($P = 0.002$).

Logistic regression was used to reveal some of the determinants of age at the introduction of solid foods (Table 7). Controlling for all the variables listed in the table, only maternal employment status was significantly associated with age at introduction of solid foods. Mothers who were employed were 1.78 times more likely to introduce solid foods at < age 4 months. Logistic regression also

Table 3 Age of weaning of infants to different food groups

Weaning food	Age of weaning (months)				Total
	1-3		≥ 4		
	No.	%	No.	%	
Cereals	63	9.1	632	90.9	695
Fruit	55	7.8	646	92.2	701
Dessert	40	5.9	634	94.1	674
Dairy	38	5.6	645	94.4	683
Vegetables	32	4.6	661	95.4	693
Eggs	16	2.4	646	97.6	662
Meat	9	1.3	660	98.7	669
Legumes	3	0.5	650	99.5	653

Table 4 Fluids other than breast milk given to infants before introduction of solid foods

Fluid	No.	%	95% CI
Infant formula milk	742	43.8	40.2–47.4
Herbal tea	739	41.8	38.2–45.4
Sweetened water	740	37.6	34.1–41.1
Water	742	36.3	32.8–39.7
Orange blossom water	741	27.7	24.4–30.9
Juice	743	10.4	8.2–12.6
Powdered milk	742	3.1	1.8–4.3
Cow's milk	740	1.1	0.3–1.8
Other fluids	614	1.5	0.5–2.4

CI = confidence interval.

revealed that breastfeeding duration and place of residence were no longer significantly associated with age of introduction of solid foods.

Discussion

The importance of feeding patterns and practices during the first year of life cannot be overlooked; they lay the foundation for food consumption throughout life and influence subsequent growth, development and morbidity [9].

Our study examined foods used for complementary feeding in the low and middle socioeconomic groups in Lebanon, as well as demographic factors associated with the time of weaning. Over 70% of the mothers in this study initiated breastfeeding soon after birth. Although this figure is encouraging when evaluated against figures from another country in the region, Saudi Arabia [10], 41% of these mothers stopped breastfeeding within 6 months and the rest interrupted breastfeeding by 9 months. Over 13% of the mothers gave their infants other liquids such as water, sweetened water and herbal teas before the 4-month benchmark, which undermines the benefits received from breast milk or formula alone [11,12]. While the increased risk of diarrhoeal diseases associated with the early introduction of nonmilk liquids has been documented previously [13,14], efforts to stop this practice have not been a priority for physicians or other health professionals. Almost 70% of infants in the sample were completely weaned before the recommended age of 1 year.

In this study, the majority of babies (41.6%) were weaned shortly after 4 months of age. Although it is reassuring that most children were not introduced to solid foods too early, it also suggests that in many cases the infants' developmental cues may have been ignored and introduction of solid foods could have occurred abruptly. Physicians or health care workers in developing countries should encourage mothers to be aware of signs that the infant is ready for solid foods, rather than state that the child can (or must) start solid foods at the 3-month or 4-month well-child visit, and reassure the mother that until 6 months of age the child can receive sufficient sustenance from breast/formula milk alone. The most common starting food was cereals, which was also seen more in formula-fed infants. But cereals were also used as a first food earlier than

Table 5 Mean [standard deviation (SD)] age of weaning of infants to different food groups according to mother's residence and place of birth

Weaning food	No.	Place of residence		P-value	No.	Place of birth		P-value
		Rural Mean (SD) age (months)	Urban Mean (SD) age (months)			Rural Mean (SD) age (months)	Urban Mean (SD) age (months)	
Fruit	676	6.6 (4.3)	5.8 (4.5)	0.027	640	6.6 (4.0)	5.7 (4.7)	0.018
Vegetables	666	7.5 (4.3)	6.2 (3.9)	< 0.001	630	7.3 (4.0)	6.3 (4.4)	0.002
Cereals	669	7.1 (5.9)	5.8 (3.9)	< 0.001	633	6.9 (5.5)	6.0 (4.7)	0.033
Legumes	627	10.9 (6.7)	9.6 (5.8)	0.01	— ^a	—	—	—
Meat	644	10.4 (6.6)	8.5 (4.6)	< 0.001	612	10.2 (6.5)	8.5 (4.4)	< 0.001
Eggs	637	9.9 (6.1)	8.8 (4.1)	0.014	— ^a	—	—	—
Dairy	657	8.5 (5.4)	7.6 (4.5)	0.019	623	8.4 (5.5)	7.6 (4.2)	0.026
Dessert	647	9.0 (6.0)	7.6 (5.6)	0.002	615	8.8 (5.9)	7.7 (5.6)	0.014

^aOnly data that were significantly different are shown.

Table 6 Mean [standard deviation (SD)] age of weaning of infants to different food groups by mother's educational and employment status

Weaning food	No.	Education level		t-value	P-value	No.	Employment status		t-value	P-value
		Low Mean (SD) age (months)	High Mean (SD) age (months)				Homemaker Mean (SD) age (months)	Employed Mean (SD) age (months)		
Fruit	704	7.1 (4.7)	5.9 (4.2)	3.13	0.002	- ^a	-	-	-	-
Vegetables	692	8.0 (5.6)	6.4 (3.5)	4.36	< 0.001	691	7.1 (4.4)	5.7 (2.2)	3.53	< 0.001
Cereals	- ^a	-	-	-	-	695	6.6 (5.4)	5.5 (2.2)	2.35	0.019
Legumes	652	11.3 (6.2)	9.8 (6.1)	2.58	0.01	651	10.5 (6.3)	8.8 (5.3)	2.30	0.003
Meat	668	10.7 (6.9)	9.0 (5.2)	3.35	0.001	667	9.8 (6.1)	8.0 (3.2)	3.26	< 0.001
Eggs	- ^a	-	-	-	-	- ^a	-	-	-	-
Dairy	- ^a	-	-	-	-	- ^a	-	-	-	-
Dessert	673	9.1 (7.9)	7.9 (4.9)	2.30	0.022	- ^a	-	-	-	-

^aOnly data that were significantly different are shown.

other food groups. Rice has been a principal supplementary food in several other Arab countries due to its availability and cost, as demonstrated by Abdulla in Iraq [15] and Wahiba et al. in Egypt [16]. Despite their level of education, mothers in these regions are typically concerned about the rate of growth of their babies. A study by Churchill and Kanawati reported that in Lebanon, a fat baby was regarded as healthy, hence cooked starches, especially rice with milk and sugar, were provided to young infants [17].

More disturbing, however, were the 21.9% of children who were introduced to solid foods and over 90% of children who were given other fluids before the recommended age of 4 months. These figures may be encouraging compared with data from other countries in the region—in Bahrain, about 62% of infants were introduced to solid foods at 3–6 months [18]. This is similar to data from developed regions, such as Norway, where 21% of the infant population were given solid foods before the age of 4 months [19],

and similar findings in Germany [20] and the United States of America [21]. However, they do pose a predicament to a public health initiative to decrease, and preferably eliminate, food-related diseases such as diarrhoea, gastroenteritis and gastro-oesophageal reflux, among others.

Our data showed that place of residence affected the age of introduction of solid foods, with urban mothers introducing these at an earlier average age than mothers residing in rural regions. This was the case for all food groups. Although no explanations were found for this, it may be due to the fact that rural mothers breastfed for a longer duration and hence delayed the introduction of solid foods. There were certain foods that were actually consumed significantly more often in rural areas, such as yoghurt, other dairy products and *bulgur*, while foods consumed more often in urban areas were fruit, potato, carrots, peas, spinach, squash, green beans, rice, baby food, beef, chicken, *muhlabiyeh* and *mughli*. The avoidance of consumption of meats during infancy in rural areas could be due to traditional beliefs, such as those reported by Abdulrahman in Bahrain [18].

Table 7 Logistic regression analysis of the associations between infant's age at weaning and selected variables

Independent variable	Age of weaning < 4 months versus ≥ 4 months (n = 575)	
	OR	95 % CI
Mother's age (1 = ≥ 30; 0 = < 30 years)	1.29	0.85–1.98
Mother's education level (1 = high; 0 = low)	1.10	0.68–1.81
Mother's place of birth (1 = urban; 0 = rural)	0.96	0.59–1.56
Mother's current place of residence (1 = rural; 0 = urban)	1.53	0.94–2.50
Mother's employment status (1 = employed; 0 = homemaker)	1.78	1.01–3.13
Type of delivery (1 = normal; 0 = caesarean section)	0.78	0.44–1.37
Breastfeeding duration (1 = ≥ 6; 0 = < 6 months)	0.00	0.00–1.95
Initiation of breastfeeding after birth (1 = a few days; 0 = a few hours)	1.42	0.80–2.52
Infant's sex (1 = male; 0 = female)	1.41	0.93–2.14

Log likelihood = 548.49; $\chi^2_9 = 47.99$; $P < 0.001$.
OR = odds ratio, CI = confidence interval.

The large sample size enabled multivariate analysis that revealed maternal employment status as a highly significant determinant of early initiation of solid food in the low and middle socio-economic groups in Lebanon. Mothers who were employed and those who were more educated initiated solid foods earlier than homemakers and those with less education. This phenomenon can be explained by the fact that the primary caregivers of these infants were most likely either the grandparents or day-care staff. More often, however, when the child is still very young (maternity leave is only 49 days in Lebanon) the grandparents are the first choice.

It should be noted that potential memory and recall errors may also have occurred as the mothers of younger children are more likely to be accurate in the information they provide compared with mothers of older children.

In conclusion, this study was successful in presenting a better understanding of the issues associated with the early introduction of solid foods to infants. Public health programmes and policies in Lebanon should address breastfeeding and issues concerning infant feeding processes for expectant and new mothers with short, clear and specific guidelines. A multidimen-

sional approach that focuses on social, psychological, economic and personal concerns is an absolute prerequisite to ensure a supportive environment that will permit a mother to carry out the most favourable infant feeding methods.

Acknowledgements

This research was supported by grant DDF 112050-088223 from the University Research Board of the American University of Beirut. We are grateful to all the participants and interviewers who made this study possible.

References

1. Kramer MS, Kakuma R. *The optimal duration of exclusive breastfeeding: a systematic review*. Geneva, World Health Organization, 2002.
2. Gibson RS, Hotz C. The adequacy of micronutrients in complementary foods. *Pediatrics*, 2000, 106(Suppl.):1298-9.
3. Pelto GH. Improving complementary feeding practices and responsive parenting as a primary component of interventions to prevent malnutrition in infancy and early childhood. *Pediatrics*, 2000, 106(5 Suppl.):1300.
4. Hop LT et al. Premature complementary feeding is associated with poorer growth of Vietnamese children. *Journal of nutrition*, 2000, 130(11):2683-90.
5. Yip R, Ramakrishnan U. Experiences and challenges in developing countries. *Journal of nutrition*, 2002, 132(4 Suppl.):827s-30s.
6. *Implementation by FAO of some of the recommendations of the Plan of Action at the World Summit for Children*. New York, United Nations Children's Fund, 2000 (http://www.unicef.org/specialsession/documentation/documents/edr_fao_en.pdf, accessed 5 July 2009).
7. Yunis K, Khogali M, Tamim H. *The first year of life (Aug. 01-Feb. 02 to Aug. 02-Feb. 03). A study on morbidity and mortality among newborn babies, infants, and under five year old children in Greater Beirut, Lebanon*. Beirut, Lebanon, Monographs of the National Collaborative Perinatal Neonatal Network, 2004.
8. *World fact book*. McLean, Virginia, Central Intelligence Agency, 2002.
9. Wright AL et al. Infant feeding practices among middle-class Anglos and Hispanics. *Pediatrics*, 1988, 88(3):776-80.
10. Fida NM, Al-Aama JY. Pattern of infant feeding at a university hospital in Western Saudi Arabia. *Saudi medical journal*, 2003, 24(7):725-9.
11. Batal M et al. Breastfeeding and feeding practices of infants in a developing country: a national survey in Lebanon. *Journal of public health nutrition*, 2006, 9(3):313-9.
12. Batal M, Boulghourjian C. Breastfeeding initiation and duration in Lebanon: are the hospitals "mother friendly"? *Journal of pediatric nursing*, 2005, 20(1):53-9.
13. Jason J, Neiburg MP, Marks JS. Mortality and infectious disease associated with infant-feeding practices in developing countries. *Pediatrics*, 1984, 74(Suppl.):702-27.
14. Brown KH et al. Infant feeding practices and their relationship with diarrheal and other diseases in Huascar (Lima), Peru. *Pediatrics*, 1989, 83(1):31-40.
15. Abdulla SM. *Food habits in Iraq* [Master's thesis]. Alexandria, Egypt, High Institute of Public Health, University of Alexandria, 1979:100-7.
16. Wahiba SA et al. Improved feeding patterns in the prevention of childhood malnutrition. *Gazette of the Egyptian Pediatric Association*, 1975, 23(2):97-109.
17. Churchill CW, Kanawati A. *Cultural factors in nutrition in Lebanon. Proceedings of the 6th symposium on nutrition and health in the Near East*. Beirut, Lebanon, American University of Beirut, 1971:282-8.
18. Abdulrahman OM. Food habits in Bahrain: infants' feeding habits. *Journal of tropical pediatrics*, 1983, 29:248-51.
19. Lande B et al. Infant feeding practices and associated factors in the first six months of life: the Norwegian infant nutrition survey. *Acta pædiatrica*, 2003, 92:152-61.
20. Kersting M et al. Measured consumption of commercial infant food products in German infants: results from the DONALD Study. *Journal of pediatric gastroenterology and nutrition*, 1998, 27:547-52.
21. Hediger ML et al. Early infant feeding and growth status of US-born infants and children aged 4-71 mo: analyses from the third National Health and Nutrition Examination Survey, 1988-1994. *American journal of clinical nutrition*, 2000, 72:159-67.