



INFANT FORMULA FEEDING PRACTICES AND THE FACTORS INFLUENCING INFANT FORMULA FEEDING: A CROSS SECTIONAL SURVEY IN AL AHSA DISTRICT OF SAUDI ARABIA

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ABSTRACT

Exclusive breast feeding has been strictly recommended by the WHO for the achievement of optimal growth, development and health of the infants. However the nursing mothers are resorting to infant formula milk feeding to their infants due to various reasons. Less milk production, maternal employment, various medical conditions and cosmetic reasons have been cited by the mothers as the main causes of disrupting the exclusive breast feeding. But the availability of numerous milk substitutes and their promotion marketing scheme by various manufacturing companies and their prescription by the pediatricians have been blamed another important factor in changing infant feeding practices all over the world including Saudi Arabia.

Result: This was a cross sectional survey done on the nursing mothers of Al Ahsa district of Saudi Arabia. The prevalence of infant formula milk feeding was 61.8% to the infants at and before the age of six months. The prevalence of infant formula milk feeding was significantly more in urban population than the rural population (Rural 268 vs Urban 320, $p=0.0001$). The prevalence of infant milk feeding was significantly lower among the illiterate mothers than the educated mothers. Similarly the prevalence of infant formula milk feeding under 6 months of age was significantly more among working women (74.51%) than the house wife (73%) and student (73.14), $p=0.0001$. Decision to start the infant formula milk feeding were taken mainly on the pediatrician (68.48%) advice which was significantly higher than that of by doctors in postnatal clinic (41.57%), nursing staff in the post natal clinic (55.55%), relative (56.52%) and TV advertisement (25.77%), $P=0.000$. Apart from the reasons of doctors' advice due to medical condition, job engagement, insufficient milk production and the fear of disfigurement of the breast, the pediatricians' role have been found responsible contributing to the introduction of formula milk within six months. Ronalacand Similac were the favorite choice followed by NAN. Eighty percent of the mothers each considered good taste and easy digestibility as the factors for buying their choice milk formula.

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INTRODUCTION

Compulsory breastfeeding till the month of six is termed as exclusive breast feeding by the WHO which strictly recommends that the nursing mother should adhere to this schedule for the achievement of optimal growth, development and health of the infants. Thereafter, the infants should be fed nutritionally adequate and safe complementary foods, while continuing to breastfeed for up to two years or beyond. Keeping in the view of the enormous benefits of breast feeding, most of the countries started long-running public health campaign to promote breastfeeding over formula feeding. In spite of their efforts not a single country in the world could achieve hundred percent of exclusive breastfeeding. According to a statistic issued by Center for Disease Control and Prevention (CDC) REF, only 22% of

babies in the USA are exclusively breastfed at 6 months of age. The Health Organization's (WHO) Global Breastfeeding scorecard states that only 23 countries in the world has achieved six month exclusive breastfeeding rates above 60 percent.^[1] Various factors have been found responsible for non-exclusive breast feeding by mothers through different studies conducted in different parts of the world. The study conducted in Ethiopia has found less milk production by mother as the main factor for non-exclusive breast feeding, as the child felt hungry after breastfeeding they have to add cow and infant formula milk.^[2] Maternal employment was significantly associated with non-exclusive breastfeeding and initiating to bottle feeding in a study done in Brazil.^[3] Ireland study found that 81.8% of the children at six weeks were provided formula milk.^[4]

The availability of numerous milk substitutes and their promotion marketing scheme by various manufacturing companies may be an important factor in changing infant feeding practices all over the world. Formula marketing has been shown to reduce breastfeeding in many studies. A study conducted in USA has shown that Mothers who received a sample of formula from the hospital at birth were more likely to use the hospital formula 1 month later. Likewise Mothers who chose formula at 1 month because their doctor recommended it were less likely to switch formula than those who chose in response to direct-to-consumer marketing.^[5] Another studies conducted in USA have shown a significant contribution of infant formula industry in the declining trend of breastfeeding habit among the nursing mothers .^[6]Exposure to infant formula information from print media and formula information from websites were found to be the cause early disruption of exclusive breast feeding and initiation of infant formula feeding in a study conducted in china.^[7]

There has been enormous growth of companies producing milk substitutes in the recent years in Al Hasa district. The aggressive marketing scheme adopted by these commercial establishments may be important factor in changing infant feeding practices in Al Hasa region. However, previous studies conducted in Al Hasa did not include this factor which could have been an important influencing factor contributing the reduction of breastfeeding. Our study will include this factor along with the other factors.

MATERIAL AND METHODS

Subjects and Methods

It was a cross sectional survey conducted throughout Al Hasa region of Saudi Arabia in which all the nursing mothers accompanying infants attending the pediatric clinics at various Primary Health Care Centers were interviewed using open structured questionnaires. The population of the survey covered mothers with children 2 years of age or less and is estimated to be between 6-7 percent of the total Al Hasa population (1 million) which constituted to be 60000 .To get the representative sample and with presumption that 60% of mother initiated infant formula feeding to the infant at the age before 12 months of age with the worst acceptable level of 75% and 95% of confidence level we got a sample of 997 .This sample were presumed to be the respondents were proportionate to the population of area of residence (Urban: Rural). Nine hundred and ninety seven mothers of children aged 4-24 months, visiting at four antenatal and children clinics of three Health Sector PHCs of Al Ahsa and one community health center were randomly chosen.

A permission letter from Ministry of Health was sought before starting the study. All the participants either signed or thump impressions were taken on the letter of consent after obtaining the informed verbal consent.

Data Collection

The variables for this survey were identified through various literature review and the data collection tools were developed in English and Arabic language. The collection tool was pretested on 10 participants who were excluded from this study. The first part of the questionnaires consisted of demographic characteristics of the participating mothers (Age, geographic distribution, education of mother and employment status of mother).The second part of the questionnaires

consisted of questions on the mothers' behavior on infant formula feedingsuch as questions on source of information on infant formula feeding, health professional helping the mothers to take decision on the choice infant formula milk and reason for continuing the same brand of infant formula milk. The questionnaires also consisted of the questions asking the mothers for the reasons to start the infant formula milk intake and stopping the exclusive breast feeding.

The number of questions was10 in number and required not more than 25 minutes for the participants to answer. The survey forms were filled by the interviewer specially trained for this. A multiple choice format of the questionnaires was prepared for the convenience of participants and the interviewer and for the ease of scoring and data management. The questionnaires were validated by three specialist pediatricians working in the local tertiary care hospital. The data were categorized, analyzed and statistically interpreted by using SPSS version 21. A p value of <.05 was considered as statistically significant. The data were analyzed using logistic regression to determine the effect of various factors on the outcome variable and to control confounding. Most of the variables were fitted to the bivariate logistic regression.

RESULTS

A total of 997 mothers attending the under-five clinics at different Primary health care centers were distributed the questionnaires. Nine hundred fifty five mothers returned the questionnaire after properly filling them making the response rate to be ninety five percent. The mean age of the mothers was 30.39 Year with St. Deviation±7.18 years (range 15-42 years).Almost 43% belonged to rural areas. Thirty four percent of the mothers were high school educated while the same percentages weregraduate. Twelve percent, Sixteen percent and five percent were illiterate, middle school and postgraduate respectively. The majority of the mothers were house wife (612, 64%) While twenty four percent were working and eleven percent students. The details of the demographic characteristics are shown in table 1.

Table 1 The socio-demographic characteristics of the study population.

Socio-demographic factor	N	Percentage
Geographical distribution		
Rural	429	45
urban	526	55
Age		
	30.39 Year with st.d±7.18 years (range 15-42 years)	
Education of the mother		
Illiterate	109	12
Primary	153	16
High school	325	34
Graduate	325	34
Post graduate	43	4
Employment Status of the mothers		
House wife	611	64p
Working	239	25
Student	105	11

Response on the questions of the mothers' behavior on infant formula feeding Asked about as when they got the information about the infant formula feeding, ten percent of the mothers narrated that they received the information while attending the prenatal clinic and the same number while attending the post natal clinic .Fifteen percent of the mothers got the information on infant feeding by the doctors at the time of discharge from

the hospital and majority of them (65%) got this information from the attending pediatrician. Pediatricians' advice accounted for almost fifty percent of the mothers to buy the choice formula milk while twenty four percent of mothers followed relative advice to buy the choice formula milk product. Seven percent by the nursing staff in the post natal clinic while nine percent by the doctors attending the postnatal clinic. Pediatricians' advice accounted for almost fifty percent of the mothers to buy the choice formula milk while twenty four percent of mothers followed relative advice to buy the choice formula milk product. Seven percent by the nursing staff in the post natal clinic while nine percent by the doctors attending the postnatal clinic. The detail of the response on the questions of the mothers' behavior on infant formula feeding is shown in table 2.

Table 2 Response on Mothers' behavior on infant formula feeding

Variables	Number	Percentage
Information on infant formula feeding		
While attending the prenatal clinic	96	10
While attending the post natal Clinic	96	10
At the time of discharge from the hospital	143	15
By the paediatrician or family physician at PHC	620	65
Decision on the choice infant formula milk		
Doctor in the postnatal clinic	89	9
Pediatrician	476	50
Nursing staff in the postnatal clinic	63	7
Relative	230	24
TV advertisement	97	10
Reason for continuing the same brand of infant formula milk		
Good taste	110	12
Easy digestibility	34	4
No side effect	297	31
As advised by the doctor	367	38
As advised by the relative	147	15

Prevalence of infant formula milk feeding habit

61.8% of the mothers (N=590) were feeding their baby with infant formula milk at and before the age of six months. The prevalence of infant formula milk feeding was significantly more in urban population than the urban population (Rural 268 vs Urban 320 ,p=0.0001).The prevalence of infant milk feeding was significantly lower among the illiterate mothers (53.47%) than the educated mothers (middle school educated 62.96%, High school educated 63.17%, graduate 70.03% and post graduate 84.12%, P=0.000). Similarly the prevalence of infant formula milk feeding under 6 months of age was significantly more among working women(74.51%) than the house wife(73%) and student (73.14), p =0.0001). Mothers with single child (59.24%) were significantly less involved in infant formula milk feeding to their babies than those with two (62.66%), three (62.16%) and four and more than four children (60.71%) p=0.001). Decision to start the infant formula milk feeding were taken mainly on the pediatrician (68.48%) advice which was significantly higher than that of by doctors in postnatal clinic (41,57%) ,nursing staff in the post natal clinic (55.55%),relative (56.52%) and TV advertisement (25.77%), P=0.000).The details of Infant formula milk feeding prevalence is shown in table 3.

Table 3 Infant formula milk feeding prevalence

	Number	percentage	P value
Infant feeding habit (at or before 6 months of age)	365	38.22	0.001
Breast feeding	590	61.78	
Infant formula milk feeding			

Geographical distribution			
Infant formula feeding			
Rural	268	45.42	0.0001
Urban	322	54.58	
Total	590	100	
Educational status of the mothers			
Illiterate (N=109)	48	44.03	
Primary school educated (N=153)	76	49.67	0.000
Secondary school educated(N=325)	185	56.96	
Graduate (N=325)	211	64.92	
Post graduate (N=43)	36	84.12	
Profession of mother			
House wife (N=449)	326	73	0.001
Working full time(N=204)	186	91.18	
Student (N=108)	78	73.14	
Mothers with the number of children			
1 child (N=184)	109	59.24	
2 children (N=233)	146	62.66	0.000
3 children (N=222)	138	62.16	
4 children (N=306)	187	60.71	
More than 4 children (N=10)	4	40	
Decision on the choice infant formula milk			
Doctor in the postnatal clinic (N=89)	37	41.57	
Pediatrician (N=476)	326	68.48	0.002
Nursing staff in the postnatal clinic (N=63)	35	55.55	
Relative (N=230)	130	56.52	
TV advertisement (N=97)	25	25.77	

When asked about the reason as why the mothers stopped breastfeeding to their youngest child, almost thirty six percent (N=343) mentioned the doctor's advice on their medical condition which included four percent of nipple problem, while twenty five percent (N=240) blamed the less milk production. However twenty nine percent (N=277) of the mothers had to stop breast feeding due to their job engagement and ten percent (N=95) due to cosmetic reason. The details of the response are shown in table 4.

Table 4 Reason for discontinuing the breastfeeding

Variables	Number	Percentage
On doctors' advice due to medical condition	343	36
Less milk production	239	25
Job engagement	277	29
Cosmetic reason	95	10

When asked about the choice of brands of milk formula which they buy from the market, Ronalac (23.37%) was the first choice closely followed by Similac (23.17%) and NAN (13.30%) among the study population. HUMANA BEBEMIL was used by 9.6% of the mothers. The details of the choice of the milk formula are shown in table 5. Eighty percent of the mothers each considered good taste and easy digestibility as the factors for buying their choice milk formula.

Table 5 Choice of brands of milk formula

Brand	Number	percentage
IGoaty	2	0.21
Nactalia	6	0.63
NAN	99	10.37
Bright 51	7	0.733
BLEMIL PLUS	36	3.77
LACTONIC	10	1.04
SUPRAMIL	8	0.84
MAEIL	2	0.21
MAMMA		
FABIMILK	31	3.25
NURALAC	32	3.35
NOVALAC	31	3.25
S-26	37	3.87

APTAMIL	15	1.57
PRIMALAC	40	4.19
HUMANA	96	10.05
BEBEMIL	39	4.08
SIMILAC	231	24.19
RONALAC	233	24.40

DISCUSSION

Despite of the well documented health benefits of exclusive breast feeding and massive awareness programme by the ministry of health, the prevalence of infant formula milk feeding is increasing day by day. In our study 61.8% of the mothers were feeding their babies under 6 months of age with infant formula milk which is higher than the similar studies in Saudi Arabia^[8] (43%), USA^[9] (52.7%) and UK (43%)^[10]. The study in northern Iraq^[11] has found a high percentage of bottle-fed infants (64%), ranging from 51% (0-2 months) to 69% (9-11 months), and representing a 25-30% increase since August 1996. Early termination of breastfeeding and replacing it by infant formula milk has also been reported from Mauritius^[12] where as high as eighty two percent mothers has to resort to infant formula and other feeding before the first 6 months. The prevalence of infant formula milk feeding was significantly more in urban population than the rural population in our study while this was not true in an Indian study where significantly higher proportion of rural mothers introduced infant formula milk in comparison to the urban mothers (25.8 % vs. 7.5%; $p=0.000$).^[13] However 55.8 % of the mother in urban areas were feeding their babies by bottle feeding within the age of 6 months versus 85.51% in rural areas ($p<0.001$) in Congo study.^[14] Nigerian study showed that all mothers breastfed their children and introduced milk formula or other milks at some stage. All urban mothers had stopped breastfeeding by 12 months, but 27.5% of rural mothers' breastfed 1 year or more.^[15]

Education of mothers played an important role in initiating the infant formula milk feeding to their babies'. In our study infant formula milk feeding to their babies was significantly highest in the graduate and post graduate mothers. Higher prevalence of infant formula milk feeding to their babies by the mothers who are educated has been found in other studies as well^[9,10,11,12]. Similarly our study found that the working women were significantly more in habit of infant formula milk feeding to their babies than their non-working counterpart. This might be due to lack of time for breastfeeding their babies'. The same results were found in other studies

Mothers with single child (59.24%) were significantly less involved in infant formula milk feeding to their babies than those with two (62.66%), three (62.16%) and four and more than four children (60.71%) $p=0.001$ in our studies. This might be due to the fact that the first expecting mothers are the main target by different government and non-government organizations for promoting the breastfeeding among them by creating awareness regarding the benefits of breast feeding.

Majority of mothers (36%) in our study discontinued breastfeeding and started infant formula milk feeding on doctors' advice due to medical condition followed by twenty nine percent who had to discontinue due to job engagement and twenty five percent who did it due to less milk production. Only ten percent did it due to the fear of disfigurement of the breast. More or less the same reasons have been mentioned by the mothers in similar studies conducted in various parts of the world.^[2,3,5,12,14,15] However

insufficient breast milk (74%) was cited as the main reason followed by misconception of the breast feeding (12%) and inadequate breast feeding facilities at their work place in a Chinese study.^[16]

Decision to start the infant formula milk feeding were taken mainly on the pediatrician (68.48%) advice, though doctors in post natal clinic, attending nursing staffs, relative and TV advertisement also played some role in our study. This is the fact that the promotion of exclusive breast feeding is a high priority for most pediatrician yet many, inadvertently, assist infant formula milk companies in their marketing, thereby undermining breast feeding.^[17]

As far as the choice of infant formula milk brand is concerned, Ronalac and Similac were the favorite choice followed by NAN. Eighty percent of the mothers each considered good taste and easy digestibility as the factors for buying their choice milk formula. Though there were 18 brands of the infant formula milk used by mothers for their babies but the popularity of these three brands may be due to the effective and vigorous propaganda by the manufacturing companies or due to the support of the paediatrician in prescribing these formulas milk may be guessed. However eighty percent of the mothers each considered good taste and easy digestibility as the factors for buying their choice milk formula.

An alarming rise of infant formula milk feeding has been found in our study which is a really a serious concern. Apart from the reasons of doctors' advice due to medical condition, job engagement, insufficient milk production and the fear of disfigurement of the breast, the pediatricians' role have been found responsible contributing to the introduction of formula milk within six months in Al Ahsa of Saudi Arabia. The results enhance our understanding of Saudi mothers' perception and attitude towards infant feeding. The findings can also help in assisting health policy makers to develop intervention programmes targeting expectant mothers and their families to promote breastfeeding at an early stage thereby leading to good health for both the mothers and their infants.

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