

AMERICAN UNIVERSITY OF ARMENIA

PUBLIC HEALTH DEPARTMENT

**DETERMINANTS AND OUTCOMES OF EXCLUSIVE BREASTFEDING IN
YEREVAN**

Thesis Project for the Master's Degree

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ABSTRACT

Introduction: Exclusive breastfeeding of the infant (i.e. breast milk and nothing else during the first 4 to 6 months of life) is an important factor which influences infant morbidity and mortality particularly from diarrheal and respiratory diseases.

A research study of infant feeding practices was carried out in 1993 in Armenia by USAID (Hekimian, 1993). Following this study, policy changes took place in Armenia. A comprehensive breastfeeding promotion program was developed by the Ministry of Health of Armenia, which included health care providers education and training, changes in hospital and maternity services practices (early breastfeeding initiation, rooming-in, etc.), and distribution of health education materials to pregnant women and mothers.

Objectives: A second survey was conducted by UNICEF in spring 1997 to study the changes which have taken place in Armenia. This study uses the existing database to determine the factors which have more influence exclusive breastfeeding. It has also been conducted medical record review of the survey infants less than 4 months of age in August 1997. The objectives of this study are:

- a) To determine the prevalence and duration of exclusive breastfeeding among infants less than four months of age in Yerevan;
- b) To determine the factors which affect exclusive breastfeeding in Yerevan;
- c) To determine the relative importance of the above mentioned variables through bivariate and multivariate analysis;
- d) To determine the prevalence of infant diarrheal and respiratory diseases among survey population less than 4 months of age.

Study design/analysis: This is a case-control study. Comparisons have been made between exclusive breastfeeding and non-exclusive groups (the second group served as control) for infants less than 4 month of age to determine the factors, which have more influence exclusive breastfeeding. It has been performed bivariate and multivariate analyses using statistical packages EpiInfo, SPSS and SAS. The variables that was explored in this study are as follows: 1) **Intrapersonal:** *Socio-Demographic* variables (mothers' age, education, employment status, number of children); *Psychosocial* (mothers' knowledge and attitude); 2) **Interpersonal:** Health care providers' practices regarding breastfeeding; 3) **Organizational:** Hospital Practices and norms (early initiation, bottle-feeding, rooming-in).

Conclusions: The main factor, which influences exclusive breastfeeding in Yerevan is maternal knowledge. The exclusive breastfeeding reduced infant morbidity from diarrheal and respiratory infections among infants less than 4 months of age in Yerevan. The results can be used in breastfeeding policy changes, which will improve the status of infant health, growth and development. It will bring a reduction in costs in the health care system due to decreases in numbers and severity of infant diseases.

I. INTRODUCTION

The importance of breast milk in protecting the newborn from infection is recognized worldwide. Many studies have shown that the rates of infant morbidity and mortality directly related to infant breastfeeding status (Huttly et al., 1987; Huffman, Combest, 1990; Mitra, Rabbani, 1995; Orlando, 1995). According to statistics, childhood diarrhea and acute respiratory infections together accounted for 7.5 million deaths of children younger than five years of age in developing countries in 1990 (Tulloch, Richards, 1993). To decrease mortality and treatment costs associated with these illnesses, the World Health Organization (WHO) has developed standard diagnostic and treatment procedures for health staff, and is working on strategies for disease prevention. One of the most important preventive measures adopted by WHO is *exclusive breastfeeding* (i.e. child receives no other food or fluids, not even water) for the first four to six months. Furthermore, **exclusive** breastfeeding can avoid problems which may arise from water and food contamination [Winikoff, 1990: cited from “Infant Feeding Practices in Armenia: Report on Comparative Study and National Survey”. Written by Kim Hekimian, 1997]. Contamination of Yerevan drinking water because of sewage system leakage is a serious problem (Kurkjian et al., 1996).

Despite worldwide promotion of breastfeeding, there is a declining trend in breastfeeding practice in many countries (Mitra, Rabbani, 1996). In this countries governments encourage breastfeeding through legislation and promotional campaigns. The success of these promotional programs depends on many factors, such as implementation of the appropriate knowledge, skills and behaviors both by health care providers and mothers. Many investigations have been done by the researchers in these countries in order to find out the most important factors, which determine breastfeeding and exclusive breastfeeding, particularly.

During the past years governments use different approaches to promote breastfeeding. These efforts include: (1) modifying postpartum hospital practices; (2) educating health care providers and mothers in

order to change their knowledge and attitudes toward exclusive breastfeeding; and (3) initiating legislation and political action toward healthier infant practices (Wilmoth, Elder, 1995).

According to WHO protocols (1989) *postpartum hospital practices* include: (1) *initiation* of breastfeeding within one hour of birth and immediate skin to skin (mother-infant) contact; (2) *explaining and showing* mothers proper positioning and attachment of the baby, which makes possible appropriate sucking and milk intake by the baby and also protects mother's breasts from engorgement; (3) frequent, *on demand* breastfeeding, which stimulates a mother's milk production; (4) *rooming-in*, when baby's crib is next to the mother's bed and mothers can breastfeed when they want; and (5) *no bottle feeding*, which is known as "nipple confusion" and stimulates babies to refuse breasts milk .

Initiation of breastfeeding within one hour after a child's birth increases the probability of exclusive breastfeeding and longer duration of breastfeeding (McDivitt et al., 1993). Furthermore, early initiation decreases risk of infection due to the protective effect of colostrum. In hospitals should be provided integrated program in order to support timely initiation.

Experience has shown that unsuccessful breastfeeding sometimes connected to *inappropriate positioning and attachment* of the baby during breastfeeding (Strembel et al., 1991). Poor attachment and positioning of the baby cause painful and sore nipples, which promotes mothers to stop breastfeeding. Therefore, explaining and showing mothers proper positioning and attachment in hospital is an important factor in successful breastfeeding.

According to research human milk production is controlled by the infant's appetite (Daly, Hartmann, 1995). Therefore, it is important infants to feed *on-demand*, in order to establish successful lactation.

Rooming-in is described in literature as a "care of the newborn infant in a crib near the mother's bed, instead of in a nursery, during the hospital stay". It has been shown that there is a significant association between rooming-in and standard breastfeeding promotion and the continuation of breastfeeding (Lindenberg et al., 1990).

Nipple confusion which is caused due to *bottle feeding*, is a situation, when infants after bottle feeding have a difficulty "to achieve the correct oral configuration, latching technique, and suckling pattern", which are necessary for successful breastfeeding (Neifert et al., 1995). Bottle feeding also increases the possibility of food contamination and consequently the percentage of diarrheal diseases.

The implementation of above mentioned hospital practices is impossible without appropriate *knowledge and attitude of health care providers*. Advice on infant feeding needs to be given early. Doctors need continuing education about nutrition and lactation management. Studies have shown that in many cases successful breastfeeding is connected to appropriate counseling of mothers by health care providers (Gupta et al., 1992; Naylor et al., 1994).

Infant feeding practices are influenced by many factors including *maternal knowledge and attitude*, culture, literacy, household income, etc. (Fidler, Costello, 1995). Health education programs for mothers which explain breastfeeding benefits play an important role on breastfeeding promotion and duration (Wilmoth, Elder, 1995).

Research on this topic has been done in many developed and developing countries, including Central/Eastern European countries. Thus, research conducted in Nottingham has shown that hospital stays of less than 24 hours were strongly associated with successful feeding (Hawthorne, 1994). Research conducted by Salt et al. (Salt et al., 1994) has shown that in Great Britain rates of breastfeeding are associated with socio-demographic characteristics, level of health care providers qualification and encouragement to breastfeed antenatally. Research conducted in Hungary and Sweden (Adam, 1990; Waldenstrom, Swenson, 1991) has shown a direct association between rooming-in practice, exclusive breastfeeding and incidence of enteric infections (Adam et al., 1991). Surveys conducted in Norway in 1973, 1982 and 1991 have shown that total breastfeeding rates increased from <30% in 1973 to > 80% in 1991 due to implementation of WHO/UNICEF recommendations (Heiberg, Helsing, 1995).

This practice now is implementing in former Soviet Union Republics. As in all former Soviet Union Republics in Armenia was also implementing late initiation, scheduled feeding and prelacteal feeding with

bottle during the first days after the birth. Rooming-in was not practiced; infants were kept in other rooms than mothers. Armenia is one of the first former Soviet Union Republics, which adopted new policy. Due to this policy exclusive breastfeeding rates have been changed in Armenia dramatically (Hekimian, 1997).

The policy changes in infant feeding practices area have begun since 1993, when the USAID funded a research study on infant feeding practices in Armenia (Hekimian, 1993). The main conclusions of this study were as follows: there was a high rate of initiation of breastfeeding, but there was no exclusive breastfeeding, and both mothers and health care providers lacked knowledge about the benefits and process of breastfeeding (Hekimian, 1993, 1997). As a result of this study Ministry of Health of Armenia adopted *Ten Steps to Successful Breastfeeding* of WHO/UNICEF Baby-Friendly Hospital Initiative. The new policy in Armenia included health care providers' education and training, changes in hospital and maternity services practices (early initiation, rooming-in, etc.), and distribution of health education materials to pregnant women and mothers.

The second research in this area was conducted by UNICEF in spring 1997 to study the changes which have taken place in Armenia (Hekimian, 1997). This study uses the existing database to determine the factors which have more influence exclusive breastfeeding for the infants less than four months of age. The survey population less than four months of age is selected, because according to WHO protocols infants should be breastfeed at least four months. Medical record review of the survey population less than four months of age was also conducted to determine the diarrheal and acute respiratory disease prevalence in study group. According to the data of Ministry of Health, these rates in Armenia now are 1.2% and 3.3% respectively.

The objectives of this study are:

- a) To determine the prevalence and duration of exclusive breastfeeding among infants less than four months of age in Yerevan;
- b) To determine the factors which affect exclusive breastfeeding in Yerevan;

- c) To determine the relative importance of the above mentioned factors through bivariate and multivariate analysis;
- d) To determine the prevalence of infant diarrheal and respiratory diseases among survey population less than 4 months of age.

The research questions and hypothesis, which explored by this study, are as follows:

1. What are the patterns of feeding practices among infants less than four months of age in Yerevan?
2. What are the postpartum care practices regarding breastfeeding and how do they affect exclusive breastfeeding among infants less than four months of age?
 - H.2.1. Late initiation of first BF (> 1 hours) will be negatively associated with exclusive breastfeeding.
 - H.2.2. Prelacteal feed with a bottle will be negatively associated with exclusive breastfeeding.
 - H.2.3. Rooming-in will be positively associated with exclusive breastfeeding.
3. What are the maternal levels of knowledge on breastfeeding and how is knowledge related to exclusive breastfeeding?
 - H.3.1. High breastfeeding knowledge will be positively associated with exclusive breastfeeding.
4. What is the relative importance of maternal knowledge, postpartum hospital practices, and socio-demographic variables in predicting exclusive breastfeeding?
 - H.4.1. In a multivariate model, with exclusive breastfeeding as the dependent variable, late initiation of first breastfeeding, rooming-in and maternal knowledge variables will predict exclusive breastfeeding, regardless of socio-demographic variables, such as maternal education, age, place of delivery.
5. What is the association between exclusive breastfeeding and prevalence of diarrheal and respiratory infections among survey population less than four months of age?

H.5.1. Exclusive breastfeeding infants will have less rates of infant diarrheal and respiratory diseases than non-exclusive breastfeeding infants.

I. METHODOLOGY

2.1. Study Design

The 1997 survey was conducted between March 20 and April 8 among mothers of infants aged 0-1 living in Yerevan. As it is mentioned above this study uses existing data base for infants less than four months of age to determine the factors which have more influence exclusive breastfeeding. This is a case-control study. Comparisons have been made between exclusive breastfeeding and non-exclusive groups (the second group served as control) for infants less than four months of age.

2.2. Study Participants

The preliminary aim of 1997 survey was to compare the results with those generated from the same survey conducted in 1993. For this reason same stratified random sampling procedure that was used in 1993 was used to select the 1997 sample (Hekimian, 1993, 1997). Eight pediatric polyclinics, located in different districts of the city, were included in the sample (Appendix 1). From each district one polyclinic was chosen. In each polyclinic, a list of infants aged 0-1 years was generated, from which mothers of infants were randomly chosen according to the methodology described below. In order to have equal distribution in every infant age group, the list of registered infants was stratified by 2-month age groups.

2.3. Questionnaire Development and Interview Process

The survey instrument was a 76-item questionnaire similar to the questionnaire used in the 1993 survey, with some modifications (Appendix 2). In 1993, the questionnaire was developed using focus group interviews to determine the most important and appropriate questions and wording. This questionnaire was based on validated WHO/UNICEF questions (Hekimian, 1993). It was translated from English into Armenian by students from the Department of Public Health at the American University of Armenia. The questionnaire was pre-tested by interviewers. Every interviewer conducted four pre-test

interviews. After pre-testing some changes were made in the wording of the questions, as well as in some of the skip commands.

The questionnaire consisted of 8 sections: 1) introduction, 2) background information, 3) prenatal care practices, 4) delivery, 5) hospital practices, 6) current feeding practices, 7) maternal knowledge and beliefs, and 8) health education channels.

The variables that was explored in this study are as follows: 1) **Intrapersonal:** *Socio-Demographic* variables (mothers' age, education, employment status, number of children); *Psychosocial* (mothers' knowledge and attitude); 2) **Interpersonal:** Health care providers' practices regarding breastfeeding; 3) **Organizational:** Hospital Practices and norms (early initiation, bottle-feeding, rooming-in).

The list of main variables and their measure is presented in Appendix 3 and 4.

Respondents were interviewed by Public Health students either at the pediatric polyclinic or at their homes via face-to-face interview. The list of interviewers is presented in Appendix 5.

2.4. Sample Size

The total sample size for all infants aged 0-1 in the Yerevan 1997 study was calculated similarly to the 1993 study (Hekimian, 1993, 1997) according to the following equation:

$n = \frac{z^2 (p)(1-p)}{d^2}$, where $p = 0.5$ (expected prevalence, which provides the maximal sample size), confidence

interval of 95 % ($z = 1.96$) and precision $d = 0.05$. Therefore, $n = \frac{(1.96)^2 (.5)(1 - .5)}{(.05)^2} = 384$. Taking into

account the expected response rate of 64%, a total of 600 mothers ($n = 384 / .64 = 600$) were sampled.

The sample size for each of the 8 polyclinics was calculated according to the relative proportion of infants at each clinic. Since 600 infants aged 0-1 had to be chosen from the total of 5678, the sample size was calculated separately for each polyclinic according to the following formula: $n_p = a_p \times n$, where a_p is

the total number of babies in each polyclinic and $x = 600/5678=0.106$ (Appendix 1). The children on the list from every polyclinic were stratified into 7 groups. The number of interviewees needed in each strata was: $n_s = n_p/x$, where x is the number of strata.

There were no refusals; however, there were a number of families registered at the polyclinics with incorrect addresses, or who had left the country. A total of 400 mothers of infants were interviewed, from which 125 were mothers of infants less than four months of age.

Because this study has used the existing database to make comparisons between exclusive breastfeeding and non-exclusive infant groups among the infants less than four months of age, power calculations were made for some main study variables for this particular group. The main variables for which the power was calculated are as follows: initiation, prelacteal feed, rooming-in, and some maternal knowledge variables. According to power calculations, with $\alpha=0.05$, and a case sample size of 26, the power for initiation is equal to 80%, for prelacteal feed and some maternal knowledge variables - 100% and for rooming-in - 71%. These calculations reveal that our sample was large enough to detect main differences between groups. However, sample size calculations done for this particular group also reveal, that ideal case sample size for this study, which would detect 25% increase in prevalence in controls is equal to 107, which would provide 80% power for all study variables, with $\alpha=0.05$, and probability of exposure in controls equal to 0.5. These calculations are done using the Power.xls computer program.

2.5. Data Record Review

A polyclinic record review was also conducted to determine the prevalence of infant diarrheal and respiratory diseases in the survey population less than 4 months of age in August 1997. The weight and height of this age group were also extracted from the records in order to check the normal growth of infants.

As the data record review was conducted approximately four months after the survey there were some missing medical records in the polyclinics because of changes of infants' addresses. The total number of

records reviewed was 105. Disease episodes were counted which had taken place from the birth of the baby until the day of the interview.

2.6. Statistical Analysis

The data was entered into Epi Info (versions 5.0 and 6.0) statistical package, and later transferred to SAS and SPSS. The weight and height were entered in Nutritional Anthropometry package of Epi Info (version 6.0). The data analyses were conducted in two phases on Epi Info, SAS and SPSS. During the first phase the analyses of frequencies of all variables for the study population was conducted and the prevalence of exclusively breastfed infants among the survey population less than four months of age was determined. The prevalence of infant diarrheal and respiratory diseases among survey population less than 4 months of age was determined by using the data collected through record review. In order to assess the normal growth of infants the Z-scores of height-for-age (HAZ), weight-for-age (WAZ) and height-for-weight (WHZ) were calculated. The further bivariate and multivariate analyses were conducted between exclusive and non-exclusive breastfed groups less than four months of age. Statistical significance of difference between these two groups and corresponding 95% confidence intervals for all study variables was assessed by bivariate analyses, using Epi Info. Bivariate analyses for some study variables were conducted for exclusive, predominant and partial or non-breastfed infant groups. The multivariate analyses were conducted on SAS. The hospital practices, maternal knowledge and some socio-demographic variables, such as maternal age and place of delivery were put in a logistic model, with exclusive breastfeeding as the dependent variable. In order to find out the association between exclusive breastfeeding and prevalence of diarrheal and respiratory infections among survey population less than 4 months of age these variables were also put in a logistic model.

III. RESULTS

3.1. Characteristics of the Sample less than Four Months of Age

3.1.1. Socio-Demographic Characteristics of the Sample

The socio-demographic characteristics of the study group are presented in Table 1. From the all eight

Table 1. Characteristics of the Sample < 4 Months of Age (Yerevan, 1997).

	Total N = 125	Exclusive n = 26	Non-exclusive n = 99	OR	95% CI
Age of Infant:					
0 -2 months	(64) 51.2%	(18) 69.2%	(46) 46.5%	2.59	0.95-7.23*
3 -4 months	(61) 48.8%	(8) 30.8%	(53) 53.5%		
Age of Mother:					
15-19	(6) 4.8%	(3) 11.5%	(3) 3.0%	4.75	0.61-38.48
20-24	(46) 36.8%	(8) 30.8%	(38) 38.4%	1.00	
25-29	(45) 36.0%	(7) 26.9%	(38) 38.4%	0.88	0.25-3.01
30-34	(16) 12.8%	(6) 23.1%	(10) 10.1%	2.85	0.68-12.14
35-39	(9) 7.2%	(1) 3.8%	(8) 8.1%	0.59	0.02-6.09
40-45	(3) 2.4%	(1) 3.8%	(2) 2.0%	2.38	0.00-41.35
Education:					
less than 10 yrs	(5) 4.0%	(1) 3.8%	(4) 4.0%	0.84	0.00-9.76
10 yrs	(39) 31.2%	(9) 34.6%	(30) 30.3%	1.06	0.33-3.07
11-14 yrs	(48) 38.4%	(11) 42.3%	(37) 37.4%	1.00	
15+	(33) 26.4%	(4) 15.4%	(29) 29.3%	0.65	0.17-2.35
Currently Working:					
yes	(8) 6.4%	(2) 7.7%	(6) 6.1%	1.29	0.17-7.81
no	(117) 93.6%	(24) 92.3%	(93) 93.9%		
Number of Children:					
one	(47) 37.6%	(9) 34.6%	(38) 38.4%	0.85	0.31-2.28
>1	(78) 62.4%	(17) 65.4%	(61) 61.6%		
Monthly Income:					
< US \$ 40	(4) 3.2%	(0) 0.0%	(4) 4.4%	0.00	0.00-7.88
US \$ 41-100	(34) 27.2%	(7) 26.9%	(27) 27.3%	1.00	
US \$ 101-200	(25) 20.0%	(4) 15.4%	(21) 21.2%	0.73	0.15-3.35
> US \$ 201	(36) 28.8%	(10) 38.5%	(26) 26.3%	1.48	0.43-5.16
Refused	(2) 1.6%	(1) 3.8%	(1) 1.0%	3.86	0.00-166.88
Don't know	(24) 19.2%	(4) 15.4%	(20) 20.2%	0.77	0.16-3.53
Number of Persons in Family:					
2-3	(6) 4.8%	(1) 3.8%	(5) 5.1%	0.72	0.03-6.89
> 4	(115) 92.0%	(25) 96.2%	(90) 90.9%		

* P < 0.05

pediatric polyclinics a total 125 mothers of children from 0 to 4 months of age were enrolled at the study.

The age distribution of infants among age groups is approximately the same. There is a statistically significant difference between exclusive and non-exclusive groups according to infant age categories. It means that infants less than 3 months of age are more likely to be exclusively breastfed than infants above 3 months of age. The mother's age range was from 15 to 45, with mean age of about 25.9, which does not differ from the mean of all sample (Hekimian, 1997). As seen in Table 1 there is a positive association between exclusive breastfeeding status and age of mothers for the group 15-19 as compared to age group 20-24 (OR=4.75) despite this difference is not statistically significant. Approximately 65% of mothers had above secondary school education (mean = 12.1). There is not statistically significant difference between exclusive and non-exclusive groups according to educational categories. Above 60% of study population had more than one child. This number is higher compared to 54% of all survey population (Hekimian, 1997). The number of women who worked was 6.4%. There are not statistically significant differences between exclusive and non-exclusive groups according to mothers' working status and number of children in families.

Approximately half of sample has monthly expenditure more than US \$100, with a median of US \$101-200. Exclusive and non-exclusive groups do not statistically differ by expenditure categories. Median number of persons lived in the families is 6, while for all study population it is 5. Mean income index is 20.3, with standard deviation of 37.1.

3.1.2. Prenatal Care and Birth History

The majority of study group (97.6%) attended prenatal consultation (Table 2). This is approximately the same number as for all survey population (97.8%) (Hekimian, 1997). Exclusive and non-exclusive groups do not statistically differ. The number of women attended prenatal consultation during the first trimester is approximately equal to the number of women attended prenatal consultation during the second trimester (48.8% and 48.0% correspondingly). The same distribution is noticed between exclusive and

non-exclusive groups (approximately 50%). About 30% of study population received advice during prenatal consultations. There is not statistically significant difference between these two groups by attendance of prenatal consultation and advice received during this attendance.

Table 2: Prenatal Care and Birth History of Mothers of Infants < 4 Months of Age (Yerevan, 1997).

	Total N = 125	Exclusive n = 26	Non-exclusive n = 99	OR	95% CI
Attended Prenatal Consultations:					
yes	(122) 97.6%	(25) 96.2%	(97) 98.0%	0.52	0.03-15.00
no	(3) 2.4%	(1) 3.8%	(2) 2.0%		
First Prenatal Consultation:					
first trimester (0-3 months)	(61) 48.8%	(13) 50.0%	(48) 48.5%	1.08	0.41-2.85
second trimester (3-6 months)	(60) 48.0%	(12) 46.2%	(48) 48.5%	1.00	
third trimester (6-9 months)	(1) 0.8%	(0) 0.0%	(1) 1.0%	0.00	0.00-76.21
Advice Received During Attendance:					
yes	(43) 34.4%	(5) 19.2%	(38) 38.4%	0.36	0.11-1.12
no	(79) 63.2%	(20) 76.9%	(54) 54.5%		
Place of Delivery:					
hospital	(123) 98.4%	(25) 96.2%	(98) 99.0%	0.26	0.01-9.73
home	(2) 1.6%	(1) 3.8%	(1) 1.0%		
Type of Delivery:					
normal/vaginal	(117) 93.6%	(25) 96.2%	(92) 2.9%	1.9	0.22-43.03
cesarean	(8) 6.4%	(1) 3.8%	(7) 7.1%		
Infant's Birth Weight:					
<2500 grams	(5) 4.0%	(1) 3.8%	(4) 4.0%	1.05	0.1-25.86
2500 +	(120) 96%	(25) 96.2%	(95) 96.0%		

Majority of study population delivered in hospital (98.4%, Table 2), which is approximately the same number as compared to the all survey population (99%) (Hekimian, 1997). From the total four home deliveries (Hekimian, 1997) two were mothers less than 4 months of age group (1.6%). The groups do not statistically differ by place of delivery. 8 women (6.4%) experienced a Cesarean section. Majority of babies (96%) was born with weight more than 2500 g, which is accepted by the WHO as normal weight at the birth. There is not statistically significant difference between exclusive and non-exclusive groups according to birth weight.

3.1.3. Hospital Practices

As it is seen from the Table 3 the 84% of mothers of infants less than 4 months of age ever breastfed their babies, from which 46.4% initiated breastfeeding within the first half an hour after delivery. The

Table 3. Post-Partum Hospital Practices of sample < 4 months of age (Yerevan, 1997).

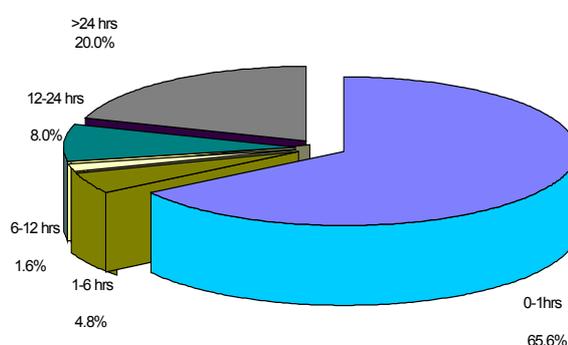
	Total N = 125	Exclusive n = 26	Non-exclusive n = 99	OR	95% CI
Ever Breastfed:					
yes	(105) 84.0%	(26) 100.0%	(79) 79.8%		
no	(20) 16%	(0) 0.0%	(20) 20.2%	0.00	0.00-0.82*
Immediate Initiation (< 30 mins):					
yes	(58) 46.4%	(12) 46.2%	(46) 46.5%	0.99	0.38-2.55
no	(67) 53.6%	(14) 53.8%	(53) 53.5%		
Time to First Put Baby to Breast:					
0 - 1 hrs. after delivery	(82) 65.6%	(14) 53.8%	(68) 68.7%	1.53	0.20-1.40
> 1 hrs. after delivery	(43) 34.4%	(12) 46.2%	(31) 31.3%		
Prelacteal Feeds:					
yes	(50) 40.0%	(14) 53.8%	(36) 36.4%	1.63	0.50-4.56
no	(52) 41.6%	(10) 38.5%	(42) 42.4%		
Explain positioning/attachment:					
yes	(72) 57.6%	(11) 42.3%	(61) 61.6%	0.46	0.17-1.19
no	(53) 42.4%	(15) 57.7%	(38) 38.4%		
Explain on demand feeding:					
yes	(86) 68.8%	(18) 69.2%	(68) 68.7%	1.1	0.38-3.26
no	(36) 28.8%	(7) 26.9%	(29) 42.0%		
Rooming-in:					
yes	(100) 80.0%	(19) 73.1%	(81) 81.8%	0.70	0.22-2.30
no	(24) 19.2%	(6) 23.1%	(18) 18.2%		
Baby Taken Out at Night:					
yes	(35) 28.0%	(4) 15.4%	(31) 31.3%	0.42	0.11-1.51
no	(68) 54.4%	(16) 61.5%	(52) 52.5%		
Bed Days:					
1-4	(66) 52.8%	(11) 42.3%	(55) 55.6%	0.63	0.24-1.65
> 4	(58) 46.4%	(14) 53.8%	(44) 44.4%		
Money Paid in Hospital:					
US \$0-100	(43) 34.4%	(7) 26.9%	(36) 36.4%	0.50	0.16-1.53
US \$101-200	(50) 40.0%	(14) 53.8%	(36) 36.4%	1.00	
US \$ > 201	(27) 21.6%	(4) 15.4%	(23) 23.2%	0.45	0.11-1.72

* P < 0.05

same number compared to all study population is only 28.3% (Hekimian, 1997). This difference is statistically significant (OR=3.46, 95% CI=2.13-5.63). This fact can be explained either by better implementation of breastfeeding policy during the last four months or by difference of mothers recall. The percentage of immediate initiated infants in exclusive and non-exclusive groups is approximately the same and there is not statistically significant difference between these groups (Table 3).

Approximately 65% of babies were put on their mothers breast within the first hour (Graph 1), which is very important factor for further successful breastfeeding. The second large group according to first put variable is babies who were put on their mothers' breast after 24 hours. After analyzing the reasons of late putting it was found out that the main reason was difficult deliveries (including cesarean section). The percentage of the first put is higher for non exclusively breastfed infant group compared to exclusive group (68.7% and 53.8% correspondingly), despite there is not statistically significant difference according to this variable between studied groups (Table 3).

Graph 1. Time to First Put Baby to Breast (Yerevan, 1997).



For successful breastfeeding is also very important that newborn baby should not receive *food other than breastmilk* before the first breastfeeding, and if it is indispensable it should be done without bottle. According to mothers' report 40% of studied population received prelacteal feed. This data approximately is the same as for all group (41%) (Hekimian, 1997). The 29.6% of these babies received the prelacteal feed by the bottle. According to our data the number of exclusively breastfed babies received prelacteal

feed is higher than the same number of non-exclusive group. However, this difference is not statistically significant (Table 3).

For successful breastfeeding is also very important baby's *appropriate attachment and positioning* during breastfeeding. One of the 10 steps of Baby-Friendly Hospital Initiative is to show mothers how to breastfeed (Saadeh et al., 1996). The 57.7% of study group mothers reported that they were explained about **positioning** and attachment of baby. This number is lower compared to the rate (67.5%) of all study population (Hekimian, 1997). According to the mothers' report the percentage of mothers of exclusively breastfed infants who explained positioning and attachment (42.3%) is lower compared to non-exclusive group (61.6%), despite the difference is not significant (Table 3).

About 70% of mothers were explained about *on demand* feeding in the hospital. The same number is received for exclusive and non-exclusive groups, which do not differ statistically. The 80% of babies stayed in the same room with their mothers (steps 7 and 8 of BFHI). The percentage of babies stayed with their mothers in exclusive group is less than in non-exclusive group. The 28% of these mothers also reported that their babies were taken out from the ward during the nights. This fact can play negative role in further successful breastfeeding practice because during this period baby can be given bottle. According to Hekimian (1997) this is due to inadequate conditions in maternity wards, where mothers stay in groups of three or four and they can not take appropriate rest and sleep. In exclusive breastfed infants' group this percentage is twice less compared to non-exclusive group, despite the difference is not significant.

The hospital practices variables (appropriate positioning/attachment, on demand feeding, rooming-in, baby taken out at night) were put in a logistic regression model with some socio-demographic, birth history and maternal knowledge variables. As seen from the Table 4, none of hospital practices variables is statistically significant.

Table 4. Adjusted Odds Ratios and 95% Confidence Intervals of Exclusive Breastfeeding Infants in a Logistic Regression Analysis for the Various Variables within the Study Population of Yerevan (1997).

Variable	β value	Odds Ratio	95% CI
Socio-demographic:			
Maternal age	1.3475	3.848	0.939 - 15.769
Cesarean section	1.0369	2.820	0.775 - 10.258
Hospital Practices:			
Explain positioning/attachment	-0.9870	0.373	0.120 - 1.162
Explain on demand feeding	0.2117	1.236	0.372 - 4.108
Rooming-in	-0.4125	0.662	0.192 - 2.288
Baby taken out at night	-0.2602	0.771	0.204 - 2.915
Maternal knowledge:			
Exclusive BF is nutritious enough	1.7099	5.529	0.584 - 52.331
Newborn needs water to quench thirst	-1.6657	0.189	0.064 - 0.562

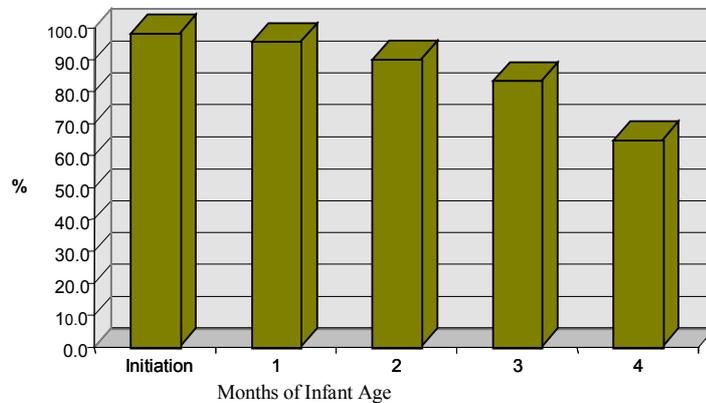
Approximately half of the mothers (52.8%) discharged from the hospital during the first 4 days (Table 3). The percentage of early discharged mothers in exclusive group is lower compared to non-exclusive. The 96% of women reported that they paid for services received in hospital. The average money paid for services was US \$ 186.8.

3.1.4. Feeding Practices

The trends in current feeding practices were found out through the question # 38 of questionnaire, which was based on mother's 24-hour recall. The percentage of breastfeeding infants less than 4 months of age is presented in Graph 2. It is noticed the decline of breastfeeding during the fourth months of age up to 65%.

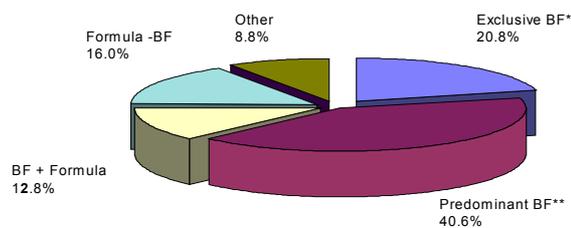
WHO defines different infant feeding categories: 1) exclusive breastfeeding, when infant receives only breast milk; 2) predominant breastfeeding, when infant receives breastmilk and liquids, 3) partial breastfeeding (BF+formula) and 4) formula feeding. The WHO main recommendation is to breastfeed infants for at least four months of age. The situation in Yerevan sample according to these categories is

Graph 2. Reported Rates of Breast Feeding in Last 24 hrs. by Infant Age in Months (Yerevan, 1997).



presented in Graph 3. As it is seen in Graph 3 approximately 21% of babies less than four months of age were exclusively breastfed. This number is higher compare with only one event of breastfed baby in 1993 and is reflected the changes, which have taken place after the implementing of new policy. It is mentioned a decline among exclusive formula users from 26% in 1993 to 16% in 1997 (Hekimian, 1993, 1997).

Graph 3. WHO Indicators for Infants < 4 Months of Age (Yerevan, 1997)



* Defined by the WHO as breastmilk only

** Defined by the WHO as breastmilk +other liquids (water, tea, juice)

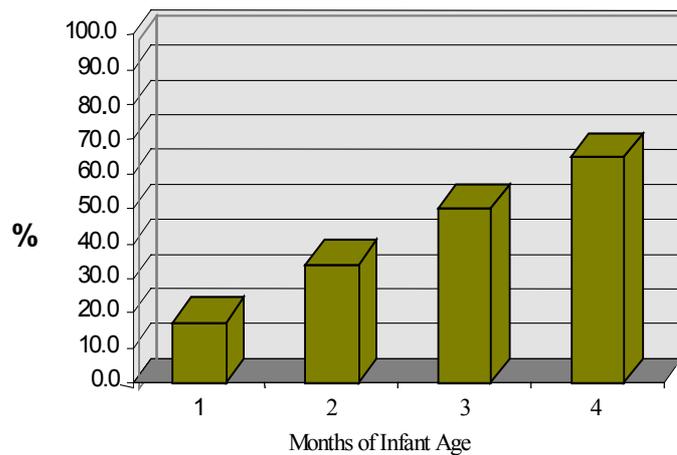
According to the WHO the *bottle feeding* also increases the possibility of infant diarrheal diseases.

Besides the use of artificial teats confuses child and decreases the sucking strength and duration which are very important factors for breastmilk supply (Saadeh et al., 1996). The percentage of bottle-fed infants

for less than 4 months of age is presented in Graph 4. The rate of bottle feeders is still remaining high (65%) despite the decrease with comparison with 1993 data (Hekimian, 1993, 1997).

According to mothers' report the mean age of giving infants other food than breastmilk is four months. Approximately 82% of mothers do feeding their infants on demand.

Graph 4. Reported Rates of Bottle Feeding by Infant Age in Months (Yerevan, 1997).



3.1.5. Maternal Knowledge

As it is shown in Table 5 the 33.0% of mothers knows the correct answer of the question "How long will a child remain healthy on breast milk alone?" (Question # 47). This percentage is approximately the same as for all sample (Hekimian, 1997). This is a low rate and indicates that there is a need of educational programs among pregnant women and breastfeeding mothers. Exclusively breastfeeding mothers has a higher knowledge (47.4%) compared to non exclusive group (33.9) but this difference is not significant.

Majority of mothers of infants less than 4 months of age belief that the cause of insufficient milk is a diet (47.2%) (Table 5), while real cause stated in literature is infrequent breastfeeding. This percentage is higher in exclusive breastfeeding group (69.6%), and the difference is statistically significant compared to non-exclusive group.

Mothers' knowledge about how long the child will remain healthy and the main cause of insufficient milk were put in logistic model with other maternal knowledge variables (Table 6). The adjusted odds

ratio in logistic model is decreasing till 2.64, with 95% confidence interval [CI]: 0.848-8.220. Thus, the result is statistically not significant.

Table 5. Maternal Knowledge about How Long Infant Will Remain Healthy on Breastmilk only and Main Cause of Insufficient Milk (Yerevan, 1997).

	Total N = 91	Exclusive n=19	Non exclusive n=62	OR	95% CI
Will remain healthy:					
0 days	(2) 2.1%	(0) 0.0%	(2) 3.2%	0.00	0.00-27.90
1 to 29 days	(1) 1.1%	(0) 0.0%	(1) 1.6 %	0.00	0.00-108.19
1 to 3 months	(10) 11.0%	(3) 15.8%	(7) 11.3%	2.21	0.33-14.21
4 to 6 months*	(30) 33.0%	(9) 47.4%	(21) 33.9%	2.21	0.60-8.35
> 6 months	(37) 40.7%	(6) 31.6%	(31) 50.0%	1.00	
don't know	(1) 1.1%	(1) 5.3%	(0) 0.0%	Undefined	
Cause of insufficient milk:					
	N = 108	n = 23	n = 85		
Diet	(51) 47.2%	(16) 69.6%	(35) 41.2%	3.27	1.11-9.89**
Stress	(24) 22.2	(3) 13.0%	(21) 24.7%	0.53	0.11-2.20

* Correct answer according to WHO/UNICEF protocols

** P < 0.05

Table 6. Adjusted Odds Ratios and 95% Confidence Intervals of Exclusive Breastfeeding Infants in a Logistic Regression Analysis for Some Maternal Knowledge Variables within the Study Population (Yerevan, 1997).

Variable	β value	Odds ratio	95% CI
Will remain healthy	-0.0711	0.931	0.300 - 2.889
Exclusive BF is nutritious enough	1.0108	2.748	0.303 - 24.926
Newborn needs water to quench thirst	-1.8084	0.164	0.052 - 0.512
Diet is a main cause of insufficient milk	0.9706	2.640	0.848 - 8.220

Mothers were asked about a series of questions related their knowledge about breastfeeding. The correct answers are presented in Table 7. It is mentioned statistically significant difference on only two questions from the total 15 of exclusive breastfeeding group compared to non-exclusive group. The first statement was "A newborn baby needs to be given water besides being breastfed to quench his/her thirst". Exclusive breastfeeding mothers knowledge was 42.3%, which is enough high rate compared to 24.2% of

Table 7. Mothers Knowledge Regarding Breastfeeding, Yerevan, 1997.

STATEMENTS READ	% answering correctly	
	Exclusive N = 26	Non-exclusive N = 99
Breastfeeding alone is nutritious enough for the first four months of life [True]	96.2%	82.8%
Breastfeeding can make a woman fat [False]	57.7%	36.4%
Breastfeeding protects a baby against diarrhea and pneumonia [True]	84.6%	88.9%
Breastfeeding changes the shape of your breasts in ways you would not like [False]	19.2%	18.2%
If a woman is breastfeeding, she is less likely to become pregnant [True]	38.5%	29.3%
A mother that does not produce enough breast milk should try to breastfeed more often [True]	73.1%	66.7%
Colostrum (the first milk) should not be fed to a baby. It is better to wait until the milk appears before putting the baby to the breast [False]	65.4%	65.7%
Infant formula is as nutritious as breast milk [False]	92.3%	89.9%
Usually, if a woman's diet is not rich in calories, her breast milk will be insufficient for feeding her child and should be supplemented with formula [False]	34.6%	35.4%
A newborn baby needs to be given water besides being breastfed to quench his/her thirst [False]	42.3%	24.2%*
When foods other than breast milk are given to the child, the mother's milk dries up [True]	57.7%	57.6%
A baby with diarrhea should stop breastfeeding while sick [False]	65.4%	67.7%
Breast milk with a watery texture is not good for the baby [False]	23.1%	37.4%
It doesn't matter how the baby grasps the nipple, as long as it is in its mouth [False]	42.3%	57.6%*
If a baby is given a bottle, he/she will stop wanting the breast after that [True]	57.7%	66.7%

* P < 0.05

non-exclusive group. The odds ratio was 0.22 (95% confidence interval [CI]: 0.07 - 0.72). Following multivariate logistic regression the odds ratio decreased to 0.189 [CI]: 0.064 - 0.562, remaining still significant (Table 4). The second statement was "It doesn't matter how the baby grasps the nipple, as long as it is in its mouth". As it is seen from the Table 7, the knowledge of non-exclusive group was higher (57.6%) than exclusive group (42.3%), and this difference is statistically significant. The odds ratio was 2.69 (95% CI: 0.99 - 7.40). This can be explained either not good understanding by mothers this question because this was false statement or mothers' knowledge in this case is not connected to their practice.

3.2. Results of Record Review

3.2.1. Prevalence of diarrheal and acute respiratory diseases (ARI) among survey population less than four months of age

As it is seen from the Table 8, exclusive breastfeeding group had only one case of diarrhea (4.3%) compared to 10 cases (12.2%) of non exclusive group, despite this difference statistically is not significant. Exclusive breastfeeding group was completely free from ARI and other diseases, while these rates for non-exclusive group was 24.4% and 13.4% correspondingly. The difference between two groups for ARI diseases is statistically significant. The multivariate analysis was not possible to perform for these numbers due to small numbers.

Table 8. Prevalence of Diarrheal and ARI Diseases among Survey Population, Yerevan, 1997.

Disease	Total N = 105	Exclusive n = 23	Non exclusive n = 82	OR	95% CI
Diarrhea	(11) 10.5%	(1) 4.3%	(10) 12.2%	0.33	0.01-2.75
ARI	(20) 19.4%	(0) 0.0%	(20) 24.4%	0.00	0.00-0.73*
Other	(11) 10.5%	(0) 0.0%	(11) 13.4%	0.00	0.00-1.60

* P< 0.01

3.2.2. Infant growth outcome

The results of weight-for-age (WAZ), height-for-age (HAZ) and weight-for-height (WHZ) Z-scores are presented in the Table 9. Only one infant had a Z score less than minus 2 for weight-for-age who was from non-exclusive group. Three infants had a Z score more than 2 for weight-for-age, from which two were from non-exclusive group. The 13% of infants had a Z-score less than minus 2 for height-for-age, from which only one baby was from exclusive group, despite this difference statistically is not significant. No one bay had a Z-score more than 2 for height for age category. The percentage of infants who had a Z-score more than 2 for weight-for-height category was 14.1%, from which only one was from exclusive breastfeeding group, and no infant had a Z-score less than minus 2. In general, these results show that the infant growth is normal in Yerevan.

Table 9. Weight-for-Age (WAZ), Height-for Age (HAZ) and Weight-for-Height (WHZ) Z-scores for Survey Population (Yerevan, 1997).

	Z scores	Total N = 92	Exclusive n = 18	Not exclusive n = 74	OR	95% CI
WAZ	< -2	(1) 1.1%	(0) 0.0%	(1) 1.4%	0.00	0.00-74.77
	> 2	(3) 3.3%	(1) 5.6%	(2) 2.7%	2.12	0.00-32.75
HAZ	< -2	(12) 13.0%	(1) 5.6%	(11) 14.9%	0.34	0.02-2.87
	> 2	(0) 0.00%	(0) 0.00%	(0) 0.00%		
WHZ	< -2	(0) 0.00%	(0) 0.00%	(0) 0.00%		
	> 2	(13) 14.1%	(1) 5.6%	(12) 16.2%	0.30	0.01-2.56

IV. DISCUSSION

4.1. Comment

Past studies have stressed the importance of research on breastfeeding in order to identify promotion strategies in both developed and developing countries (Lindenberg et al., 1990; Mitra, Rabbani, 1995; Wilmoth, Elder, 1995). This study is a continuation of the study on infant feeding practices in Armenia since 1993 (Hekimian, 1993, 1997). The advantage of this study is that it compares exclusive and non-exclusive breastfed infant groups according to many variables (intrapersonal, interpersonal, organizational), in order to find out the most important factors which determine the exclusive breastfeeding and its outcomes in Yerevan.

Exclusive breastfeeding in this study is defined according to WHO definition as the proportion of infants less than four months of age who receive only breastmilk (plus vitamins or other medicines) (McCann et al., 1994). It has been found that from the total of 125 infants of the survey population less than four months of age only 26 infants (20.8%, Graph 3) were exclusively breastfed. Of course, this is a higher rate compared to the percentage of exclusively breastfed babies in the 1993 study (0.7%) (Hekimian, 1993) and reflects the changes which have taken place after the implementation of the new policy. On the other hand, this rate still remains low and it means that much work still needs to be done in this area. Corresponding rate in many developed countries is above 70% (Heiberg, Helsing, 1995).

This study found a statistically significant difference between exclusive and non-exclusive groups according to infant age categories (Table 1). It means that infants less than 3 months of age are more likely to be exclusively breastfed than infants above 3 months of age. One potential reason may be that mothers of infants believe that their babies need additional supplements, such as fruitjuice or tea, after two months of age. Educational programs among pregnant women and breastfeeding mothers which underline the importance of exclusive breastfeeding and emphasize that babies do not need any supplements till 4 to 6 months of age will play a significant role in the change of mothers' behavior.

The importance of advice received during prenatal consultation for further successful breastfeeding has been mentioned in many studies (Hardy et al., 1982; Wilmoth, Elder, 1995). In our study the rate of exclusive breastfeeding mothers who received advice during prenatal consultation was twice less than the rate of non-exclusive mothers, despite this difference is not statistically significant (Table 2). This difference could be due to factors not controlled in this study, such as previous infant feeding practices, birth intervals, etc.

Low percentages of hospital practices variables (immediate initiation, time to first put baby to breast, explain positioning/attachment, explain on-demand feeding) have shown that hospital practices need to be improved in Yerevan (Table 3). Hospital policies should pay also attention on the facts that in hospitals still practices high percentage of prelacteal feeding with bottle and babies are taken out during the nights from the mother's ward (Table 3).

According to this study the main factor which determines an exclusive breastfeeding in Yerevan is maternal knowledge. Mothers' belief that newborn baby does not need water to quench thirst is a main factor which determines an exclusive breastfeeding (Table 7). This variable is also identified by multiple regression analysis as contributing more to the possibility of exclusive breastfeeding (Table 4, 6).

The second maternal knowledge question, which also demonstrated statistically significant differences between two groups, was maternal knowledge about how the baby grasps the breast nipple. Non exclusive group demonstrated a better knowledge than the exclusive group (Tables 7). One potential explanation of this result could be that mothers had difficulty understanding the question. The question was posed as a true/false statement: "It does not matter how the baby grasps the nipple as long as it is in its mouth". Mothers of exclusive breastfeeding infants who have been breastfeeding for a while may be feeding their babies in the "correct" way, but do not attach importance to the mechanics of how the baby latches on to the breast.

This study has also demonstrated that the prevalence of acute respiratory diseases is strongly connected to exclusive breastfeeding status of babies (Table 8). The rate of diarrheal diseases is also associated with

exclusive breastfeeding status of babies, despite this difference is not significant due to the small numbers. This can be explained by the fact that the number of diseases was accounted from the birthday of baby till the day of interview, which was covered a winter period. As it is known the rate of diarrheal diseases is always higher in summer months.

4.2. Limitations of the Study

This study has several limitations.

1. *Recall bias.* The data collected for this study is mainly based on mothers' recall, which is a potential source of bias in case-control studies.
2. *Sample size.* Our limited sample size for this study (cases = 26; controls = 99) limited the power of certain variables and the possibilities to perform multiple logistic regression analysis for some study variables. In order to have a power equal to 80% for all study variables the sample size for cases and controls would have to be 107 for each. The large sample size was also preferable for multiple logistic regression analysis.
3. *Problems with questions.* The questionnaire did not contain questions for exclusive breastfeeding outcomes. It would be preferable to ask about diarrheal and ARI diseases to mothers through the three day recall questions. The potential source of bias here was that mothers' may not have applied to the doctor for cases of diarrhea and ARI or health care providers may not have registered these cases in the records.
4. *Interval in data record review process.* The data collection for prevalence of diseases was preferable to conduct simultaneously to the interview process in order to avoid loss to follow up. Due to changes in addresses only 84% of records was possible to review. For some variables not recorded in the records, this percentage even lower, 69.2%.

4.3. Conclusions

The main conclusions for this study are as follows:

1. The rate of exclusive breastfeeding among the infants less than four months of age in Yerevan is 20.8%, which is higher than in 1993 but lower compared to some developed countries (Heiberg, Helsing, 1995).
2. The rate of some postpartum health care practices such as immediate initiation within 30 minute, explanation about positioning/attachment, on demand feeding by health care providers is low and need to be improved. Rooming-in is accompanied with taking out babies during the nights, which increases the possibilities of bottle feeding and nipple confusion.
3. Many statements of maternal knowledge gained less than 50% of correct answers. This means that there is a need of additional educational programs among pregnant women and breastfeeding mothers.
4. The main factor, which determines the exclusive breastfeeding in Yerevan among infants less than four months of age is maternal knowledge.
5. The exclusive breastfeeding reduces infant morbidity from diarrheal and respiratory infections among the infants less than four months of age in Yerevan.

4.4. Recommendations

On the basis of the results of this study we would like to make several recommendations.

1. *Health education among pregnant women and breastfeeding mothers.* In order to increase the rate of exclusive breastfeeding, the mothers need to be explained about advantages of exclusive breastfeeding for infant and mother health. They should know that their babies do not need water and other supplements till four months of age. This is **possible** to do through printed materials, as well as through mass media campaign. Printed materials should be distributed in polyclinics and delivery hospitals. The financing of these materials is possible through the donor agencies.

2. *Improvement in implementation of the Ten Steps To Successful Breastfeeding Policy in delivery hospitals.* Hospitals should formulate a strategy for infant feeding. Development of such policy in every hospital can be very useful and educational both for mothers and health care providers.
3. *Improvement in implementation of the Ten Steps To Successful Breastfeeding Policy by the Ministry of Health (MOH).* Since 1993 Ministry of Health implements the Ten Steps To Successful Breastfeeding Policy. But as it is seen from this study many steps are not in satisfied level. The rooming-in is accompanies with taking babies out during the nights, initiation within the first 30 minutes took place approximately in 50% of infants. MOH should be informed about these results, which will help policy makers to develop more strict policy and control. These policy changes will improve the status of infant health, growth and development. It will bring a reduction in costs in the health care system due to decreases in numbers and severity of infant diseases.

- # -

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APPENDIX 1.

Pediatric Polyclinics and Number of Respondents (Yerevan, 1997)

Name of Polyclinics	Total Number of Infants in Each Polyclinic (a_p)	Sample Size for Each Polyclinic (n_p)
Hospital #1 Polyclinic (Manuk)	456	48
Hospital #3 Polyclinic	833	88
Polyclinic #1	406	43
Polyclinic #2	933	99
Polyclinic #4	992	105
Polyclinic #5	685	72
Polyclinic #6	651	69
Polyclinic #9	720	76
Total	5678	600

APPENDIX 2.

INFANT FEEDING PRACTICES IN ARMENIA, 1997

Questionnaire for Mothers of Infants 0-12 months of age

1. Location _____ Data Entry # _____
2. Interviewer _____
3. Date of Interview _____
- _____
- Time of interview start _____
- Time of the interview end _____

I am a student Department of Public Health of the AUA. We are conducting a survey concerning infant feeding practices in Yerevan. And I am calling for your patience to help us answering the questions which I am going to ask you. Your personal experience and participation in this survey could make a valuable input in our investigations. The interview will take approximately 15 minutes. Any information that you give will remain confidential.

BACKGROUND INFORMATION:

4. Mother's Name _____
5. Are you currently employed?
- 1. No
 - 2. Yes
6. Mothers Date of Birth _____ (Day / Month / Year)
7. Level of Education (Years)
- 1. school (8)
 - 2. school (10)
 - 3. college (2)
 - 4. institute / university (5)
 - 5. post graduate _____
 - 6. other _____
- Total Years _____
8. Number of children _____
9. Name of Youngest Child _____ (use this name in every question which refers to this child)
10. Date of Birth of the Youngest Child _____ day / month / year)

PRENATAL CARE

11. Did you go to prenatal consultations with (name of youngest child)?

1. No (if No go to Q # 14)

2. Yes

if yes, specify the place

1. district polyclinic

2. hospital

3. other _____

12. What month of pregnancy did you start to go?

_____ month

13. Did you receive advice about breastfeeding during consultations?

1. No (if No go to Q #14)

2. Yes

99. Don't know

If yes, what kind of advice you received there?

a. _____ Breastfeed your child, breast milk is the best

b. _____ Breastfeed w/o schedule

c. _____ Breastfeed with schedule

d. _____ Breastfeed frequently

e. _____ Don't worry if your milk is insufficient

f. _____ Don't worry if your milk is not fatty enough

g. _____ Don't worry about your diet

h. _____ Feed only breastmilk for 4 - 6 months

i. _____ Avoid bottle - feeding

j. _____ Mother is not able to recall massages

k. other _____

DELIVERY (Now I am going to ask you some questions concerning the birth of your youngest child)

14. City of Delivery of Youngest Child (name)

1. Yerevan

2. Other regions of Armenia

3. Outside of Armenia

15. Place of Delivery of Youngest Child (name)

1. hospital

(specify the name) _____

2. home

(specify who attended the birth)

1. doctor

2. nurse

3. relatives

4. other _____

16. Type of delivery (READ RESPONSES)

- 1. Vaginal w/o induction
- 2. Induced Vaginal
- 3. Cesarean section

17. Did you have an episotomy (stitches)?

- 1. No
- 2. Yes
- 99. Don't know

18. What was the birthweight of your infant in grams?

_____ grams

HOSPITAL PRACTICES - now I'm going to ask you questions about what happened after delivery with your youngest child

19. When was the baby put to your breast for the first time after the delivery?

_____ minutes
_____ hours
_____ days

20. How long after the delivery did you first BF your child?

_____ minutes
_____ hours
_____ days
 00. Was never brought to breastfeed
 99. Don't know

21. What was the reason it was brought at that time and not sooner? (Do not read answers)

- 1. That is the normal time
- 2. RH conflict
- 3. other _____
- 99. Don't know

22. Before the baby was brought to you to be breastfed, was it fed something else?

- 1. No (if No skip to Q # 23)
- 2. Yes
- 3. Don't know

if Yes,

(22a) what was it fed ?

- 1. donor's milk
- 2. glucose water
- 3. infant formula
- 4. mother's breastmilk (pumped)
- 5. Other _____
- 99. Don't know

(22b) Were those things fed with a bottle?

- 1. No
- 2. Yes
- 99. Don't know

23. Has a hospital nurse or a doctor ever explained to you about positioning and attachment of the baby for breastfeeding?

- 1. No
- 2. Yes
- 99. Don't know

24. Has a hospital nurse or doctor ever explained to you about the amount on-demand feeding?

- 1. No
- 2. Yes
- 99. Don't know

25. Did your baby stay with you in your while you were in the hospital?

- 1. No
- 2. Yes
- 99. Don't know

26. Was the baby ever taken out of the room for the night?

- 1. No
- 2. Yes
- 99. Don't know

27. How many days did you stay in the hospital?

_____ days

28. How much did you pay for the delivery, in total?

_____ drams
_____ US dollars
_____ 00 Refusals
_____ 99 Don't know

CURRENT FEEDING PRACTICES

Now I am going to ask you to think about the last 24 hours.

29. Since this time yesterday had your youngest child been breastfed?

- 1. No
- 2. Yes

30. If no, why aren't you breastfeeding? (main reason)

- 1. child too old (go to Q # 32)
- 2. child gave up breast (go to
- 3. insufficient milk/no milk (Go to Q # 31)
- 4. mother ill (go to Q # 32)
- 5. child ill (go to Q # 32)

- 6. problems nursing (sore nipples, mastitis, etc.) (go to Q # 32)
- 7. new pregnancy (go to Q # 32)
- 8. other _____ (go to Q # 32)

31. If it was 3, how was it explained?

- 1. infant cried after feeding
- 2. pediatric test weighting
- 3. appearance of milk
- 4. had no milk first time tried to breastfeed
- 5. the child was not gaining its weight
- 6. other _____

32. If your youngest child is not breastfeeding now, did it ever breastfeed?

- 1. No
if no, why did you not BF from the beginning? (do not read answers)
 - 1. no milk (go to Q # 38)
 - 2. mother ill (go to Q # 38)
 - 3. child ill (go to Q # 38)
 - 4. problem with breasts (go to # 38)
 - 6. other _____
- 2. Yes
if yes, how old was the child when it stopped breastfeeding? (go to Q # 38)
_____ months
_____ days

33. If your youngest child had been breastfed since this time yesterday, was this the only source of food?

- 1. No
- 2. Yes

34. On average, how many times do you BF during the day?

_____ times

35. Do you BF your child at night?

- 1. No
- 2. Yes
if yes, how many times?

36. Do you breastfeed your child on a schedule or on-demand?

- 1. by schedule
- 2. on-demand

37. Do you breastfeed your child using both breasts during each breastfeeding?

- 1. No
- 2. Yes

Again, I am going to ask you think about the feeding of your child during the last 24 hours

38. Since this time yesterday has this child received any of the following? (READ ALL RESPONSES)

- _____ vitamins, mineral supplements or medicines
- _____ plain water
- _____ sweetened or flavored water
- _____ fruitjuice
- _____ tea
- _____ infant formula (if yes, specify _____)
- _____ fresh, canned or powdered milk
- _____ solid or semi-solid food (eg crackers, soup, rice etc.)
- _____ Narineh
- _____ yogurt (Madzun)
- _____ breastmilk
- _____ other _____

39. Since this time yesterday did this child drink anything from a bottle with a nipple/teat?

- 1. No (if No skip the Q)
- 2. Yes (if Yes, specify, but DO NOT READ ANSWERS)
 - 1. water
 - 2. juice
 - 3. infant formula
 - 4. other _____

40. Do you ever leave the bottle in the child's mouth while sleeping?

- 1. No (if no, go to Q # 41)
- 2. Yes

41. How frequently do you leave the bottle in the child's mouth while sleeping?

- 1. Every day
- 2. Once a week
- 3. Rearly

42. How old was your youngest child when you gave him/her any other liquids besides breastmilk and water?

_____ months
_____ days

- code 00 if has not given

43. How old was your youngest child when you first gave him/her any food besides breast milk?

_____ months
_____ days

- code 00 if has not given

44. How old was your youngest child when you first gave him infant formula?

_____ months
_____ days

- code 00 if has not given

45. Have you ever had painful and oedematic breast?

- 1. No (if no, go to Q # 46)
- 2. Yes

(45a) If yes, have you turned to a health care provider?

- 1. No (if no, go to Q # 45b)
- 2. Yes

If yes, who?

- 1. Pediatrician
- 2. Gynecologist
- 3. Other _____

(45b) Did you cease breastfeeding due to this problem?

- 1. No
- 2. Yes

MATERNAL KNOWLEDGE AND BELIEFS

46. In your opinion, what do you think is the main cause of insufficient/no milk?

- 1. diet
- 2. stress
- 3. infection
- 4. environment/pollution
- 5. infrequent breastfeeding
- 6. fatigue
- 7. other _____
- 99. Don't know

47. According to you, up to what age will a baby remain healthy by only breast feeding, not even water, juice, or any other food?

_____ months
_____ days
_____ 99 if Don't know

I AM GOING TO READ SOME STATEMENTS TO YOU. I WANT YOU TO TELL ME IF YOU AGREE, DISAGREE OR DON'T KNOW.

48. Breastfeeding alone is nutritious enough for the baby for the first four months of life.

- 1. No
- 2. Yes
- 99. Don't know

49. Breastfeeding can make a woman fat.

- 1. No
- 2. Yes
- 99. Don't know

50. Breastfeeding protects a baby against diarrhea and pneumonia.
- 1. No
 - 2. Yes
 - 99. Don't know
51. Breastfeeding changes the shape of your breasts in ways you would not like.
- 1. No
 - 2. Yes
 - 99. Don't know
52. If a woman is breastfeeding, it is harder for her to become pregnant.
- 1. No
 - 2. Yes
 - 99. Don't know
53. A mother that does not produce enough breastmilk should try to breastfeed more often.
- 1. No
 - 2. Yes
 - 99. Don't know
54. Colostrum (the first milk) should not be fed to a baby. It is better to wait until the first milk appears before putting the baby to the breast.
- 1. No
 - 2. Yes
 - 99. Don't know
55. Infant formula is as nutritious as breastmilk.
- 1. No
 - 2. Yes
 - 99. Don't know
56. Usually, if a woman's diet is poor, her breastmilk will be insufficient for feeding her child and should be supplemented with infant formula.
- 1. No
 - 2. Yes
 - 99. Don't know
57. A newborn baby needs to be given water besides being breastfed to quench his/her thirst.
- 1. No
 - 2. Yes
 - 99. Don't know
58. When foods other than breastmilk are given to the child, the mother's milk dries up.
- 1. No
 - 2. Yes
 - 99. Don't know

59. A baby with diarrhea should stop breastfeeding while sick.
- 1. No
 - 2. Yes
 - 99. Don't know
60. Breastmilk with a very watery texture is not good for the baby.
- 1. No
 - 2. Yes
 - 99. Don't know
61. It doesn't matter how the baby grasps the nipple, as long as it is in its mouth. {
- 1. No
 - 2. Yes
 - 99. Don't know
62. If a baby is given a bottle, he/she will stop wanting the breast after that.
- 1. No
 - 2. Yes
 - 99. Don't know
63. Putting a child to sleep with a bottle of sweetened liquids or milk is harmful for a child's first teeth.
- 1. No
 - 2. Yes
 - 99. Don't know
64. Which do you feel is easier, formula feeding or breastfeeding?
- 1. formula feeding
 - 2. breastfeeding
65. Is colostrum (the first milk) good for the baby?
- 1. No
 - 2. Yes
 - 99. Don't know
66. When your youngest child was born, did you have anyone in the house to help with housework, care of the baby, shopping, etc.?
- 1. No
 - 2. Yes

PEDIATRIC POLYCLINIC

67. When did you first visit a pediatric polyclinic after delivery of your youngest child?
- _____ days
_____ months
- code 00 visit never

68. Did you receive any breastfeeding counseling during that first visit?

- 1. No (skip to Q # 70)
- 2. Yes
- 99. Don't know

69. What was the counselling?

- a. _____ Breastfeed your child, breast milk is the best
- b. _____ Breastfeed w/o schedule
- c. _____ Breastfeed with schedule
- d. _____ Breastfeed frequently
- e. _____ Don't worry if your milk is insufficient
- f. _____ Don't worry if your milk is not fatty enough
- g. _____ Don't worry about your diet
- h. _____ Feed only breastmilk for 4 - 6 months
- i. _____ Avoid bottle - feeding
- j. _____ Mother is not able to recall massages
- k. _____ other _____

70. Have you ever received infant formula as a humanitarian aid for your youngest child?

- 1. No
- 2. Yes

HEALTH EDUCATION CHANNELS

71. Do you have a television which works at home?

- 1. No
- 2. Yes

71a. If yes, have you watched the Armenian television channels in the last two days?

- 1. No
- 2. Yes

70 a. if yes, what did you watch? _____

72. Do you have a working radio in your house?

- 1. No
- 2. Yes

72a. If yes, have you listened to the radio in the last two days?

- 1. No
- 2. Yes

72b. If yes, what station did you listen to? _____

73. Have you read any newspapers in the last week?

- 1. No
- 2. Yes

73a. If yes, what have you read? _____

74. Have you read any print materials about breastfeeding?

- 1. No
- 2. Yes
 - 74a. If yes, what?
 - 1. Book (specify) _____
 - 2. Brochure
 - 3. Newspaper
 - 4. Other

75. On average, how much does your family spend each month?

- 1. Below 20, 000 drams (below US \$ 40)
- 2. 20,001 drams to 50,000 drams (US \$ 40 to \$ 100)
- 3. 50,001 drams to 100,000 drams (more than \$ 200)
- 4. more than 100,00- drams (more than \$ 200)
- 5. Refused to answer
- 99. Don't know

76. How many people live in your family?

_____ person

THANK YOU VERY MUCH FOR YOUR COOPERATION!!!

APPENDIX 3.

Dependent Variables and their Measures (Yerevan, 1997)

Variable	Measure
1. Breastfeeding status	Dichotomous (24 hr. recall)
a) exclusive breastfeeding (breast milk only) b) predominant BF (breast milk + liquids) c) partial (breast milk + formula) d) formula without breast milk e) Other	a) breastfeeding (Y/N) b) breastfeeding (Y/N), liquids (Y/N) c) breastfeeding (Y/N), formula (Y/N) d) formula (Y/N) e) other liquids/other foods (Y/N)
2. Duration of breastfeeding	Continuos (birth to cessation date)
3. Formula use < 4 months of age	Dichotomous (24 hr. recall) select infants < 4 months of age a) formula feed (Y/N)

APPENDIX 4.

Independent Variables and their Measures (Yerevan, 1997)

Variable	Measure
Socio-demographic:	
<i>Maternal</i> Work status Maternal Age Education Parity	Dichotomous (Y/N) Categorical Categorical (≤ 10 yrs, 11-12 yrs, 15 yrs, 16+ yrs) Categorical (primi vs. multiparous)
<i>Infant</i> infant age infant birth weight	Continuos Categorical (<2500 g, 2500+ grams)
Health Care Services	
<i>Prenatal</i> Prenatal Attendance Start of First Visit	Dichotomous (Y/N) Categorical by Trimester (0,1,2)

<i>Delivery</i> Place of Delivery Type of Delivery <i>Postpartum</i> Time to First Breastfeed Prelacteal Feed Prelacteal Bottle Rooming-in BF instruction by health care providers	Categorical (1-8) Dichotomous (vaginal/C-section) Categorical (1-6hrs vs. >6) Dichotomous (Y/N) Dichotomous (Y/N) Dichotomous (Y/N) Dichotomous (Y/N)
Maternal knowledge re: BF Infant age for exclusive BF Excl. BF nutritious enough - 4 month BF makes a woman fat BF protects against diarrhea and pneumonia BF changes shape of breast you won't like If woman is BF, less likely to get pregnant If not produce enough milk, BF more often Colostrum should not be fed to infant Infant formula as nutritious as Breast milk If diet not rich in calories, give formula Newborn needs water to quench thirst If other foods given, breast milk dries up Baby with diarrhea should stop breastfeeding If breast milk watery, supplement Importance of how baby grasps nipple If give baby bottle, will stop wanting breast	Dichotomous (correct/incorrect)

APPENDIX 5.

Survey Interviewers (Yerevan, 1997)

1. Marine Adamian
2. Karine Grigorian
3. Anahit Kazanchian
4. Ruzanna Mkhitarian
5. Narine Movsesian
6. Ruzanna Gerorgian
7. Liana Hovakimian
8. Zaruhi Janibekian
9. Naira Khachatryan
10. Nune Mangasarian
11. Karine Markosian
12. Lousine Mayroyan
13. Gohar Panajian
14. Nelly Tadevosian
15. Svetlana Topchian