FACTORS ASSOCIATED WITH EXCLUSIVE BREASTFEEDING AMONG INFANTS AGED 0-6 MONTHS IN A PERI-URBAN LOW INCOME SETTLEMENT OF KANGEMI, NAIROBI

*Ayisi, R. K.[1], Thuita, F.[2], Njeru, E.[3] & Wakoli, A. B.[4]
[1]Health Services, Nairobi City County, Kenya
[2]School of Public Health, University of Nairobi, Kenya
[3]School of Public Health, University of Nairobi, Kenya
[4]School of Science and Technology, University of Eastern Africa- Baraton, Kenya.
*Corresponding Author

Abstract

Breastfeeding is an important determinant of a child's growth and development. This study's intent was to determine prevalence of exclusive breastfeeding and its associated factors among infants aged 0-6 months in a peri-urban area, Kangemi in Nairobi County. A descriptive cross-sectional study design was used. The study employed sampling with probability proportional to size (PPS). A semi-structured questionnaire was administered to randomly selected 334 mother-infant pairs for infants aged 0-6 months. To determine factors associated with exclusive breastfeeding, a chi-square test and Logistic regression were used at a significance level of 0.05. From the study findings, the prevalence of exclusive breastfeeding was 45.5% among infants aged 0-6 months in Kangemi, Nairobi. The practice of exclusive breastfeeding decreased with age of infant. Further, age of infant, household income, father's education, household size and birth spacing were found to be important factors in the initiation and maintenance of exclusive breastfeeding.

Key words: Factors, exclusive, breastfeeding, infant, practice.

1.0 Introduction

Breastfeeding is an important determinant of a child's growth and development. A major cause of death in infants and young children is inadequate breastfeeding practices in combination with high levels of disease (Quinn *et al*., 2005). According to Black *et al*. (2008), sub-optimal breastfeeding especially non-exclusive breastfeeding in the first six months of life results in 1.4 million deaths and 10% of disease burden in children younger than 5 years. A report by World Bank (2012) shows a low rate of exclusive breastfeeding among infants less than six months in Sub-Saharan Africa at 35%. About one in ten children die in the first year of life and one in six dies before the age of 5 years in Madagascar (Quinn *et al*., 2005). In South Africa, the Demographic and Health Survey of 1998 indicated that 10% of children 0-3 months were exclusively breastfed and only 2% of children 4-6 months were exclusively breastfed (World Health Organization, 2003). A study in Eastern Uganda by Ingunn *et al*. (2007) on low adherence to exclusive breastfeeding showed that 7% and none practiced exclusive breastfeeding by 3 and 6 months respectively.

In Kenya, infant and young child feeding (IYCF) practices are sub-optimal. The Kenya Demographic Health Survey (KDHS) 2008-09 report indicated that exclusive breastfeeding is not common as only 32% of infants under six months of age are exclusively breastfed. This was however an improvement from the exclusive breastfeeding rates reported in KDHS 2002-03 where only 13% of infants under six months of age were exclusively breastfed. The general trend indicates a decline in exclusive breastfeeding practice with age, with only 13.2% of infants still exclusively breastfed by 6 months of age (KDHS, 2008-09). This situation is of public health concern and factors contributing to low uptake of exclusive breastfeeding for six months need to be identified and addressed.

2.0 Materials and Methods

A descriptive cross sectional study was conducted in Kangemi, a low income peri-urban area of Nairobi, Kenya. The study population consisted of mother-infant pairs for infants aged 0-6 months residing within the study area. The study excluded mother-infant pairs where the infants were twins, and/or sick.

The sample size of 334 was determined using the Fisher's formula (Fisher *et al*., 1991). It was calculated based on the Kenyan national prevalence of exclusive breastfeeding of 32% (KDHS, 2008-09) and a level precision at 95% level of confidence. The ten villages of Kangemi, namely Marenga, Kang'ora, Machagucha, Gichagi, Rift Valley, Central, Waruku, NITD, Sodom and Watiti were used as clusters for sampling purposes. Sampling with probability proportional to size (PPS) was used to get the number of households per village based on the population of each village. With the total number of households with mother-infant pairs for infants aged 0-6 months being N = 2038, the minimum sample size being n = 334, a multiplier k = n/N = 0.164 was applied to determine the number of households for each cluster as shown in Table 1.

…………………………………..
Insert Table-1 Here
…………………………………..

Households with infants aged 0-6 months were randomly selected using an Excel generated set of random numbers. With the aid of Community Owned Resource Persons (CORPs), the households were visited for data collection. A semi-

structured questionnaire was used to gather information from respondents who were biological mothers. Data were processed and analysed using Statistical product and service solution (SPSS version 17.0). The dependent variable was exclusive breastfeeding while independent variables were maternal and socio-demographic factors. Association between exclusive breastfeeding and independent variables was investigated using the Chi-square test at a significance level of 0.05. Logistic regression analysis was then performed to identify predictors of exclusive breastfeeding, and to control for confounding factors.

Approval to carry out the study was obtained from the Kenyatta National Hospital/University of Nairobi (KNH/UoN) Ethics and Research committee. Permission to collect data was also obtained from the District Commissioner (DC) Westlands District and from the District Medical Officer of Health (DMOH) in-charge of all the public health facilities in the District and the officer in-charge of Kangemi health centre. Written consent to participate in the study was sought from the respondents before administering questionnaires. Research assistants explained to the respondents the purpose of the research and assured them of confidentiality.

3.0 Results
3.1 Background characteristics of the mothers
Table 2 shows that more than a half (55.8%) of mothers were aged 25 years or younger and nearly a half (44.2%) over 25 years old. The mean age (± SD) of mothers was 25±4.4 years. Nearly all mothers (93.1%) were married while 6.9% were single, separated, divorced or widowed. Almost all mothers (99.4%) were Christians. Two-thirds (66.3%) of households had either four members or less. Less than half (46.7%) of mothers attained primary level education while (40.7%) completed secondary education. Over a half (54.1%) of fathers to the index child attained secondary education. Nearly all of fathers (92.5%) were the main income earners in the household. More than two-thirds (74.2%) of mothers were housewives, 7.9% were formally employed, another 7.9% were informally employed, and 14.8% self-employed. Over a half (56.8%) of fathers were employed in formal sector, 26.8% informally employed while 14.8% self-employed. Majority (44.9%) of households had an average monthly income from all sources of above Kenya shillings (KES) 10,000 (US $ 125).

………………………………..
Insert Table-2 Here
………………………………..

3.2 Prevalence of exclusive breastfeeding
The study findings showed that overall, almost a half (45.5%) of mothers were exclusively breastfeeding their infants at the time of the study. The median duration of exclusive breastfeeding was two months. Analysis of breastfeeding by age group however showed a decrease in exclusive breastfeeding rates with infants' age. It was highest (78.8%) for infants below one month and lowest (19.1%) for those aged 5-6 months (Figure 1).

………………………………..
Insert Figure-1 Here
………………………………..

3.3 Factors associated exclusive breastfeeding
A chi-square test was utilized to assess the relationship between exclusive breastfeeding and selected maternal factors which included; mother's occupation, attendance of antenatal clinic (ANC), gestational age at first ANC attendance, number of ANC visits, number of times counseled on infant feeding, mother's knowledge on recommended introduction of complementary feeds, birth spacing of the index child with previous child for those infants who were not firstborns and birth order as shown in Table 3.

………………………………..
Insert Table-3 Here
………………………………..

Table 4 shows the relationship between exclusive breastfeeding and selected socio-demographic factors using a chi-square test. Factors assessed included age of mother and that of index child, marital status, household size, education level of mother and father to the index child, occupation of mother and father to the index child, and average monthly household income from all sources.

………………………………..
Insert Table-4 Here
………………………………..

The Chi-square test showed no association between exclusive breastfeeding and maternal factors. Age of study infants was found to be significantly (x^2=51.283, 3df, p=0.000) associated with exclusive breastfeeding. Other socio-demographic factors such as age of mother, marital status, household size, highest education level of mother and father, occupation of both mother and father and monthly household income had no influence on duration of exclusive breastfeeding.

3.4 Independent predictors of exclusive breastfeeding
Logistic regression was performed to identify the independent determinants of exclusive breastfeeding. All predictor variables analyzed by chi-square test were used as predictors in the logistic model. Two logistic regression models were performed; one for all study infants and a second one for infants aged one month only. Results of logistic regression for all study infants are shown in Table 5.

………………………………..
Insert Table-5 Here
………………………………..

Results from logistic regression analysis performed showed that younger infants were more likely to be exclusively breastfed (p=0.000, OR=0.575). Further, mothers from households with high monthly income were more likely to

practice exclusive breastfeeding (p=0.003, OR=4.731). All the other variables were not significantly related with exclusive breastfeeding. *Table 6 shows logistic regression for infants aged one month only.*

……………………………………..

Insert Table-6 Here

……………………………………..

Logistic regression analysis performed for infants aged one month showed that education level of the father had a positive relationship with exclusive breastfeeding (p=0.034, OR=19.324). Household size and birth spacing were inversely related to the practice of exclusive breastfeeding (p=0.015, OR=0.195 and p=0.036, OR=0.938 respectively). However, all the other variables had no significant relationship with exclusive breastfeeding.

4.0 Discussion

The study findings indicated that the prevalence of exclusive breastfeeding was 45.5% among infants 0-6 months of age in the study area. This prevalence was relatively higher when compared to the national exclusive breastfeeding rate of 32% (KDHS, 2008-09). The rate of exclusive breastfeeding however decreased with increasing age of infants. While the proportion of exclusively breastfed infants was high at 1-2 months (41.7%), this decreased with age to (11.3%) at 5-6 months. A similar trend was observed at national level with 52% of children aged 0-1 month, 34.8% 2-3 months, 13.2% 4-5 months and 3.6% 6-8 months (KDHS, 2008-09). In another study conducted by Amadhila (2005), nearly a half (48.5%) of mothers practiced exclusive breastfeeding for infants aged 0-4 months. A two-year prospective study conducted in Kangemi found that by one month 75% of infants had received complementary feeds/fluids and by the fourth month 94% had received complementary feeds/fluids (Muchina and Waithaka, 2010).

The study findings showed that age of infants was associated (p<0.05) with exclusive breastfeeding. This compares well with findings from other studies. In a study conducted in Yatta Division, Kitui, age of the child was found to be related with exclusive breastfeeding practice (Maundu, 2007). These findings suggest that the younger the child the higher the chances of being exclusively breastfed. In Namibia, age of child was also significantly (p=0.001) associated with exclusive breastfeeding (Amadhila, 2005). Other socio-demographic factors including age of mother, marital status, religion of mother, household size, highest education level of mother and father, main income earner in the household, occupation of both mother and father and monthly household income were not associated with exclusive breastfeeding practice. Similarly, another study found that marital status, household head, education and household income were not related with exclusive breastfeeding (Maundu, 2007). In a study conducted by Ndolo (2008), it was found that age of mother and marital status influenced exclusive breastfeeding. Amadhila (2005) found no association between age of mother, marital status, level of education and employment with exclusive breastfeeding for infants aged 0-4 months in Namibia.

In this study, attendance of Ante Natal Clinic (ANC) during the previous pregnancy was found not related with exclusive breastfeeding practice. This differs with findings of another study which found a significant (p<0.05) association between ANC attendance and exclusive breastfeeding (Maundu, 2007). Gestation at first ANC visit, number of times counseled on infant feeding, birth order of index child, birth spacing with the previous child and knowledge of mother on the age at introduction of complementary feeding were not associated exclusive breastfeeding. A study conducted by Muchina (2007) in Nairobi found that knowledge on proper breastfeeding practices was associated with exclusive breastfeeding practice by mothers. Similarly, Ndolo (2008) found an association between mother's knowledge and exclusive breastfeeding. On the contrary, ANC attendance and breastfeeding education received were found not associated with exclusive breastfeeding in Namibia (Amadhila, 2005).

Findings indicated that mothers received support and advice on breastfeeding from various groups. Health workers at the local health facility were reported by 83% of respondents to promote exclusive breastfeeding during health education sessions and through one-on-one counseling sessions with mothers. Others who reportedly supported mothers to breastfeed exclusively were spouses/male partners, friends, mothers in-law and neighbours. Mothers in-law were found to significantly (p=0.010) influence the practice of exclusive breastfeeding. This may be attributed to the extensive community level awareness on importance of exclusive breastfeeding conducted in the study area by community health workers. These findings are similar to those of a study done in eastlands area of Nairobi where more than a half (57%) of neighbours, friends and workmates formed the largest bloc advising mothers to start giving other foods by three months (Ashene, 2006). In Namibia, Amadhila (2005) found that mothers received support on infant feeding decisions from their spouses (32.3%), their mothers (22.1%) and health workers (7.3%). In a study conducted in Dhaka, Bangladesh that looked at effects of community-based peer counseling on exclusive breastfeeding practices, 70% of women in intervention group were exclusively breastfeeding compared to only 6% in the control group (Haider, 2000).

Further, the study findings indicated that mothers received information on exclusive breastfeeding through media such as television and newspapers. Newspapers were found to significantly (p=0.038) influence exclusive breastfeeding. Similarly, Muchina (2007) found that 32.3% of mothers reported learning about infant feeding through the mass media and 10.3% through print media. These would enlighten mothers more on infant feeding practices.

5.0 Conclusion

The prevalence of exclusive breastfeeding in the study area is higher than the national rates across all the age categories. From the study findings, important factors in the initiation and maintenance of exclusive breastfeeding include household income, father's education, household size and birth spacing.

Acknowledgements

References

Amadhila, F. (2005). *Factors that influence exclusive breastfeeding in Windhoek District in Namibia.* (Unpublished MPH Thesis). Department of Applied Nutrition, University of the Western Cape. 2005.

Ashene, C.K. (2006). *Factors attributed to the prevalence of early complimentary feeding of infants in Eastlands area of Nairobi.* (Unpublished MPH Thesis). Department of Applied Nutrition, University of Nairobi.

Black, J.T., Terreri, N. and Victora, C.J. (2008). Maternal and child undernutrition: global and regional exposures and health consequences. *The Lancet*; 371(9608): 243-260.

Fisher, A.A., Laing, J.E., Stoeckel, J. E. and Townsend, J.W. (1991). Handbook for family planning operations research designs (2nd Edition). *The Population Council*, New York 10017: 22.

Haider, R. (2000). Effect of community-based peer counselors on exclusive breastfeeding practices in Dhaka, Bangladesh: a randomized controlled trial. *The Lancet*; 356: 1643-47.

Ingunn, M.S., Wamani, H., Karamyi, C., Semiyega, N., Tumwine, J. and Tylleskar, T. (2007). Low adherence to exclusive breastfeeding in eastern Uganda: a community-based cross-sectional study comparing dietary recall since birth with 24-hr recall.

Kenya Demographic Health Survey (2002-03), Kenya National Bureau of Statistics (KNBS) and ICF Macro. Calverton, Maryland: KNBS and ICF Macro.

Kenya Demographic Health Survey (2008-09), Kenya National Bureau of Statistics (KNBS) and ICF Macro. Calverton, Maryland: KNBS and ICF Macro.

Maundu, J.M. (2007). *Assessment of feeding practices and the nutritional status of children 0-36 months in Yatta Division, Kitui.* (Unpublished MPH Thesis). Department of Applied Nutrition, University of Nairobi.

Muchina, E.N. (2007). *Maternal breastfeeding practices in relation to growth and nutrition status of children aged 0-23 months in Nairobi, Kenya.* (Unpublished MSc Thesis). Department of Applied Nutrition, University of Nairobi.

Muchina, E.N. and Waithaka, P.M. (2010). Relationship between breastfeeding practices and nutritional status of children aged 0-24 months in Nairobi, Kenya. *African Journal of Food, Agriculture, Nutrition and Development*.

Ndolo, L.M. (2008). *Factors associated with introduction of complimentary of infants below six months, in Machakos District, Kenya.* (Unpublished MSc Thesis). Department of Applied Nutrition, University of Nairobi.

Quinn, V.J., Guyon, A.B., Schubert, J.W., Stone-Jimenez, M., Hainsworth, M.D. and Martin, L.H. (2005). Improving breastfeeding practices on a broad scale at the community level; success stories from Africa and Latin America. *Journal of Human Lactation*; 21:345-354.

World Bank (2012). World Bank Report.

World Health Organization (2003). Nutrition Data Banks: Global Data Bank on Breastfeeding.

Annexure

Table 1: Number of respondents sampled in each cluster

Village	Number of households	Number of respondents
Marenga	238	39
Kang'ora	142	23
Machagucha	120	20
Gichagi	230	38
Rift valley	250	41
Central	259	42
Waruku	117	19
NITD	134	22
Sodom	255	42
Watiti	293	48

Table 2: Socio-economic and demographic characteristics

Characteristic	Frequency	Percent (%)
Age of mother		
≤ 25 years	184	55.8
> 25 years	146	44.2
Marital status		
Living in union	309	93.1
Not living in union	23	6.9
Religion of mother		
Christian	330	99.4
Muslim	2	0.6
Household size		
≤ 4 members	220	66.3
≥ 5 members	112	33.7
Highest education level of mother		
No education	4	1.2
Primary	155	46.7
Secondary	135	40.7
College/tertiary	38	11.4
Highest education level of father		
Primary	89	28.3
Secondary	170	54.1
College/tertiary	55	17.5
Occupation of mother		
Formal employment	26	7.9
Informal employment	26	7.9
Self-employment	33	10
Housewife	244	74.2
Occupation of father		
Formal employment	180	56.8
Informal employment	85	26.8
Self-employment	47	14.8
None	5	1.6
*Monthly household income		
< KES 2 500	5	1.5
KES 2 501-5 000	48	14.5
KES 5 001-10 000	130	39.2
> KES 10 000	149	44.9

*KES- Kenya shillings, Monthly household income: < KES 2 500 (US $ 31), KES 2 501-5 000 (US $ 31-62), KES 5 001-10 000 (US $ 63-125), > KES 10 000 (US $ 125).

Table 3: Maternal factors influencing breastfeeding

Variable	EBF (n=151) Number (%)	Not EBF (n=181) Number (%)	Statistical test
Occupation of mother			
Formal	11 (7.3)	15 (8.4)	x^2=1.318, 3df, p=0.725
Informal/casual	11 (7.3)	15 (8.4)	
Self-employment	18 (12)	15 (8.4)	
Housewife	110 (73.3)	134 (74.9)	
Attendance of ANC			
Yes	151 (100)	178 (98.9)	x^2=1.688, 1df, p=0.502
No	0	2 (1.1)	
Gestation at 1st ANC			
≤ 3 months	21 (14.6)	15 (8.6)	x^2=4.643, 4df, p=0.321
4 months	25 (17.4)	31 (17.7)	
5 months	35 (24.3)	40 (22.9)	
6 months	34 (23.6)	56 (32)	
> 6 months	29 (20.1)	33 (18.9)	
Birth spacing with previous child			
0 (first born)	51 (34.2)	69 (38.5)	x^2=0.684, 2df, p=0.711
≤ 24 months	16 (10.7)	17 (9.5)	
>24 months	82 (55)	93 (52)	
Times ANC visits			
1-2 times	21 (13.9)	30 (16.9)	x^2=1.886, 2df, p=0.389
3-4 times	109 (72.2)	116 (65.2)	
>4 times	21 (13.9)	32 (18)	
Counseled on infant feeding			
None	47 (31.1)	52 (29.5)	x^2=1.981, 3df, p=0.576
Once	53 (35.1)	73 (41.5)	
2-3 times	39 (25.8)	36 (20.5)	
>3 times	12 (7.9)	15 (8.5)	
Birth order			
1st born	52 (34.7)	69 (38.1)	x^2=0.699, 2df, p=0.705
2nd born	56 (37.3)	68 (37.6)	
At least 3rd born	42 (28)	44 (24.3)	
Mother's knowledge on age at start of complementary feeding			
< 4 months	19 (12.6)	34 (19)	x^2=2.665, 2df, p=0.264
4-6 months	94 (62.3)	100 (55.9)	
> 6 months	38 (25.2)	45 (25.1)	

*EBF- exclusive breastfeeding, ANC- Antenatal clinic, df- degree of freedom
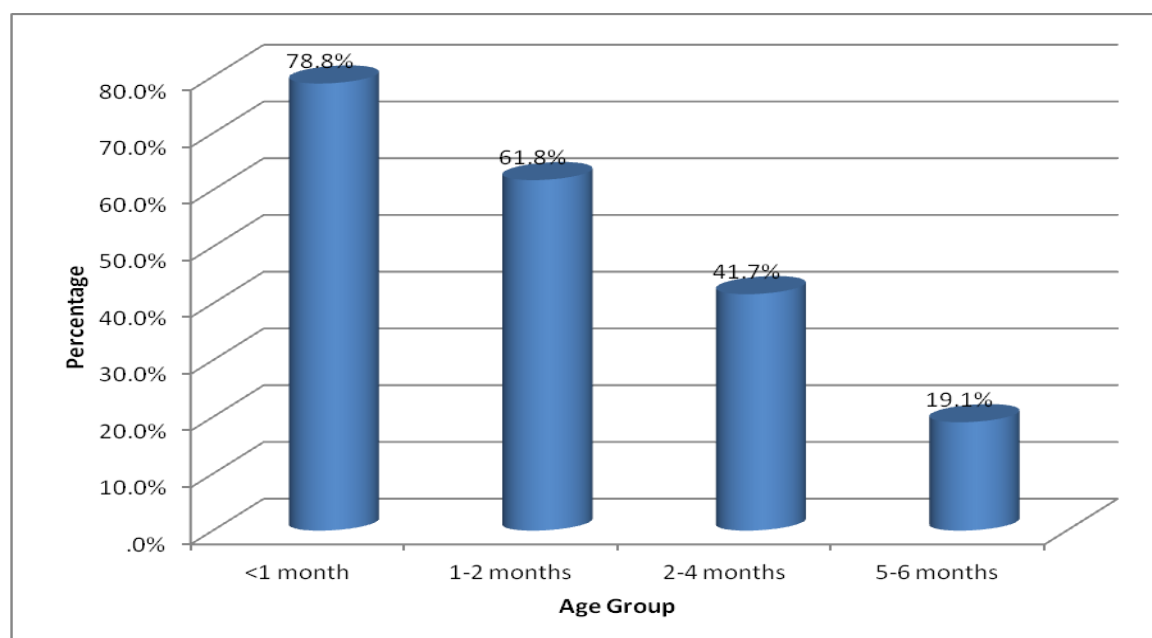

Figure 1: Distribution of study infants by exclusive breast feeding

Table 4: Socio-demographic factors and breastfeeding

Variable	EBF (n=151) Number (%)	Not EBF (n=181) Number (%)	Statistical test
Age of mother			
≤ 25 years	84 (55.6)	100 (55.9)	x^2=0.002, 1df, p=0.966
>25 years	67 (44.4)	79 (44.1)	
Age of index child			
< 1 month	26 (17.2)	7(3.9)	x^2=51.283, 3df, p=0.000
1-2 months	63(41.7)	39 (21.5)	
3-4 months	45 (29.8)	63(34.8)	
5-6 months	17 (11.3)	72 (39.8)	
Marital status			
Living in union	143 (94.7)	166 (91.7)	x^2=1.141, 1df, p=0.285
Not living in union	8 (5.3)	15 (8.3)	
Household size			
≤ 4 members	97 (64.2)	123 (55.9)	x^2=0.509, 1df, p=0.476
≥ 5 members	54 (48.2)	58 (32)	
Mother's education			
No education	2 (1.3)	2 (1.1)	x^2=4.010, 3df, p=0.260
Primary	62 (41.1)	93 (51.4)	
Secondary	66 (43.7)	69 (38.1)	
College/tertiary	21 (13.9)	17 (9.4)	
Father's education			
Primary	37 (25.3)	52 (31)	x^2=1.252, 2df, p=0.535
Secondary	83 (56.8)	87 (51.8)	
College/tertiary	26 (17.8)	29 (17.3)	
Occupation of mother			
Formal	11 (7.3)	15 (8.4)	x^2=1.318, 3df, p=0.725
Informal/casual	11 (7.3)	15 (8.4)	
Self-employment	18 (12)	15 (8.4)	
Housewife	110 (73.3)	134 (74.9)	
Occupation of father			
Formal	90 (61.2)	90 (52.9)	x^2=2.476, 3df, p=0.480
Informal/casual	34 (23.1)	51 (30)	
Self-employment	21 (14.3)	26 (15.3)	
None	2 (1.4)	3 (1.8)	
Monthly household income			
< KES 2500	2 (1.3)	3 (1.7)	x^2=1.216, 3df, p=0.749
KES 2501-5000	19 (12.6)	29 (16)	
KES 5001-10000	63 (41.7)	67 (37)	
> KES 10000	67 (44.4)	82 (45.3)	

*EBF- exclusive breastfeeding, KES- Kenya shillings, df- degree of freedom

Table 5: Results of logistic regression analysis for all infants in the study

Variable	β	Wald's statistic	d.f	p-value	OR
Age of infant	-5.528	29.806	1	0.000	0.575
Sex	0.132	0.151	1	0.698	2.224
Household size	0.850	0.310	1	0.578	1.467
Children under five	-0.170	0.178	1	0.673	1.860
Mothers age	0.012	0.501	1	0.821	1.118
Mothers education	-0.318	0.663	1	0.160	1.565
Father's education	-0.450	1.109	1	0.292	1.473
Father's occupation	0.483	1.828	1	0.176	3.261
Household income	0.817	4.178	1	0.003	4.731
Counseled on IYCF	-0.806	0.049	1	0.825	1.967

* IYCF- Infant and Young Child Feeding, d.f- degree of freedom, OR- Odds Ratio

Table 6: Results of regression analysis for infants aged one month

Variable	β	Wald's statistic	d.f	p-value	OR
Sex	-0.767	0.392	1	0.531	0.464
Birth spacing	-.0.064	4.404	1	0.036	0.938
Household size	-1.635	5.938	1	0.015	0.195
Children under five	0.529	0.235	1	0.628	1.697
Mothers age	0.057	0.14 7	1	0.702	1.058
Mothers education	-0.274	0.063	1	0.802	0.760
Father's education	2.961	5.482	1	0.034	19.324
Father's occupation	-1.712	2.160	1	0.142	0.180
Household income	-2.020	2.824	1	0.093	0.133
Counseled on IYCF	0.846	0.605	1	0.437	2.330

* IYCF- Infant and Young Child Feeding, OR- Odds Ratio, d.f- degree of freedom