

Study of the Relationship between Exclusive Breastfeeding Rates and the Cost of Infant Health Care of Nurses at Kenyatta National Hospital, Kenya

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Abstract

Prevalence of exclusive breastfeeding (EBF) rates remain relatively low at 36% globally and 36% in Africa as comparable to Kenya (61%). The reason for this remains speculative at this point. Thus, to investigate the issue further, this study was conducted. The low EBF rates have also been associated with higher morbidity. The study was set to determine the costs of morbidity associated with low EBF among nurses at Kenyatta National Hospital. The study used prospective cohort design and data was collected using structured questionnaire. A sample of 435 EBF and N-EBF nurses cross matched for age, marital status infant age, and parity were enrolled. The study showed that majority of the nurses were of age between 30 - 34 years, majority (40%) were married and most of them had one child. About 214 nurses' children had experienced disease incidences (RTI, GE and OM). There was significant association between disease incidences and feeding practice ($p < 0.05$). The children who were exposed were 2.69 times more likely to suffer from the three diseases. The overall baseline factor revealed that the group exposed to NONEBF were more likely to suffer from RTI, GE and OM than the unexposed.

Keywords: Exclusive Breastfeeding (EBF); RTI; GE; OM

Introduction

Low EBF practice has been associated with frequent infant morbidities such as RTI [1], GE [2], OM [3] among others. Frequent infant morbidities increases health care related costs [1,4]. Despite the fact that nurses are trained on the importance of EBF and are the first line promoters of EBF, research shows that nurses have lower EBF rates than non-nurse working mothers [5,6]. Nosocomial infections, especially in developing countries may be indirectly contributing to low EBF practice among nurses. A study by Hila (2009) found that 62.3% of the sampled hospitals had restrictive child visitation policies in place to reduce nosocomial infections among the children. Nurses work in an environment where the chances of one being exposed to infectious diseases is very high. In order to achieve EBF, lactating working mothers have been encouraged to bring along their babies to work and to take lactation breaks in between work. Whereas these may work for other lactating working mothers, nurses' work environment (hospital) is infectious and could predispose their babies to nosocomial infections. Nurses who constantly provide bedside care to patients aid in the spread of nosocomial infections among patients [7-9]. This may also mean that there is a higher likelihood for these nosocomial infections to be transmitted through them to their breastfeeding infants. Infants may be exposed at the hospital as studies have found newborns to with nosocomial infections [10-12]. Studies have also found children to acquire nosocomial infections in the wards beside what they were admitted with [13-15].

Research Methods

Study area

The study was conducted at KNH which is the largest referral hospital in East Africa. KNH also has many nurses compared to other hospitals who are the study subjects in this case hence was easy to conduct the study.

Study population

The study population were women (nurses) of reproductive age.

Study design

This study adopted prospective cohort design to demonstrate the relationship between nurses' breastfeeding practices with frequency of morbidities. All nurses with children aged 6 to 8 months were targeted for the study. A baseline study was then conducted to identify the EBF mothers to form one arm of the study while NON-EBF mothers formed the other arm of the study. The EBF mothers were matched by NON-EBF mothers by age of the baby, age of the mother, marital status and parity to avoid biasness.

Study method

The study used both quantitative and qualitative data collection methods but the dominant method was quantitative. The qualitative method used FGD, KII and in-depth interviews was done to explore and explain the relationship between nurses' breastfeeding practice with their infant morbidity at KNH. This method was used to explain findings, expand understandings and validate data from quantitative method through in-depth interviews and open ended questions.

Sampling method/technique

This adopted purposive sampling technique using random sampling method where all EBF mothers with 6 months, 7 months and 8 months old babies were enrolled into the study. A list of mothers meeting the criteria below was made and using random tables those meeting the criteria were chosen. The sample size was determined by Fisher, *et al.* (2007) $N = Z^2pq/d^2$ n = desired sample size z = standard deviation of required confident level given as 1.96 p = proportion of the target population. The sample size was 384. Since this study is associated with high dropout of participants as in any cohort because it's longitudinal, an increment of 20% of the sample size was provided to cater for the drop out and hence increase response rate. Hence the sample size was adjusted to $n=384*20\%=76$, hence the targeted sample size was $384+76=460$.

Inclusion criteria

1. The study included female nurses who were employees of KNH.
2. Those with children between six and eight months old.
3. Those with history of having breast fed the children.
4. Those whose children had no history of underlying diseases that could interfere with immunity like sickle cell disease, HIV, leukaemia just to mention a few.
5. The nurses who gave consent.

Exclusion criteria

- 1. The study included female nurses who were employees of KNH.
2. Those with children between six and eight months old.
3. Those with history of having breast fed the children.
4. Those whose children had no history of underlying diseases that could interfere with immunity like sickle cell disease, HIV, leukaemia just to mention a few.
5. The nurses were excluded from this study on basis that they are on leave, off duty or have declined to participate.

Ethical considerations

The research approval was given by KNH/University of Nairobi (UoN) and GLUK ERC.

Results

Description of the study population

The study population was 435, (215 on EBF wing while 220 were on the NON-EBF wing). For age, majority of the respondents (174) were between ages 34 - 40 while ages 45 - 49 had the least (4). Marital status had married respondents as majority (185) while those who were divorced were the least (50). On parity, majority of the respondents (150) were para 2's while para 4 + 1 had the least (6).

Table 1 shows a significant positive correlation between exposed feeding practice and consultation fee for RTI, GE and OM indicating that the more nurses exposed their children to NEBF, then their children stood high chances of suffering from the three diseases hence increasing the cost of RTI, GE and OM consultation fee. The t-test were all significant at p < 0.05 meaning that we reject the null hypothesis and conclude that there was a significant association between exposed feeding practices and RTI, GE and OM consultation cost.

Table with 4 columns: Feeding Practice, Pearson correlation, P value, t-test. Rows include RTI, GE, and OM.

Table 1: Association of feeding practice with consultation cost.

Table 2 shows a significant positive correlation between exposed feeding practice and medication cost for RTI,GE and OM indicating that the more nurses exposed their children to NEBF, then their children stood high chances of suffering from the three diseases hence increasing the medication cost for RTI, GE and OM medication fee. The t-test were all significant at p < 0.05 meaning that we reject the null hypothesis and conclude that there was a significant association between exposed feeding practices and RTI, GE and OM medication cost.

Table with 4 columns: Feeding Practice, Pearson correlation, P value, t-test. Rows include RTI, GE, and OM.

Table 2: Association of feeding practice with medication cost.

From figure 1, no child was hospitalized from the nurses who practices EBF. For NEBF, the highest cost of hospitalization for RTI was 220,200 Ksh in the month four and 157,800 Ksh in month two. Other months reported none of the cases of hospitalization. The data was also processed using chi-square test which gave a significant value ($\chi^2 = 10301$, $df = 1$, $p\text{-value} < 2.2e-16$) indicating a significant association between feeding practices and cost of hospitalization.

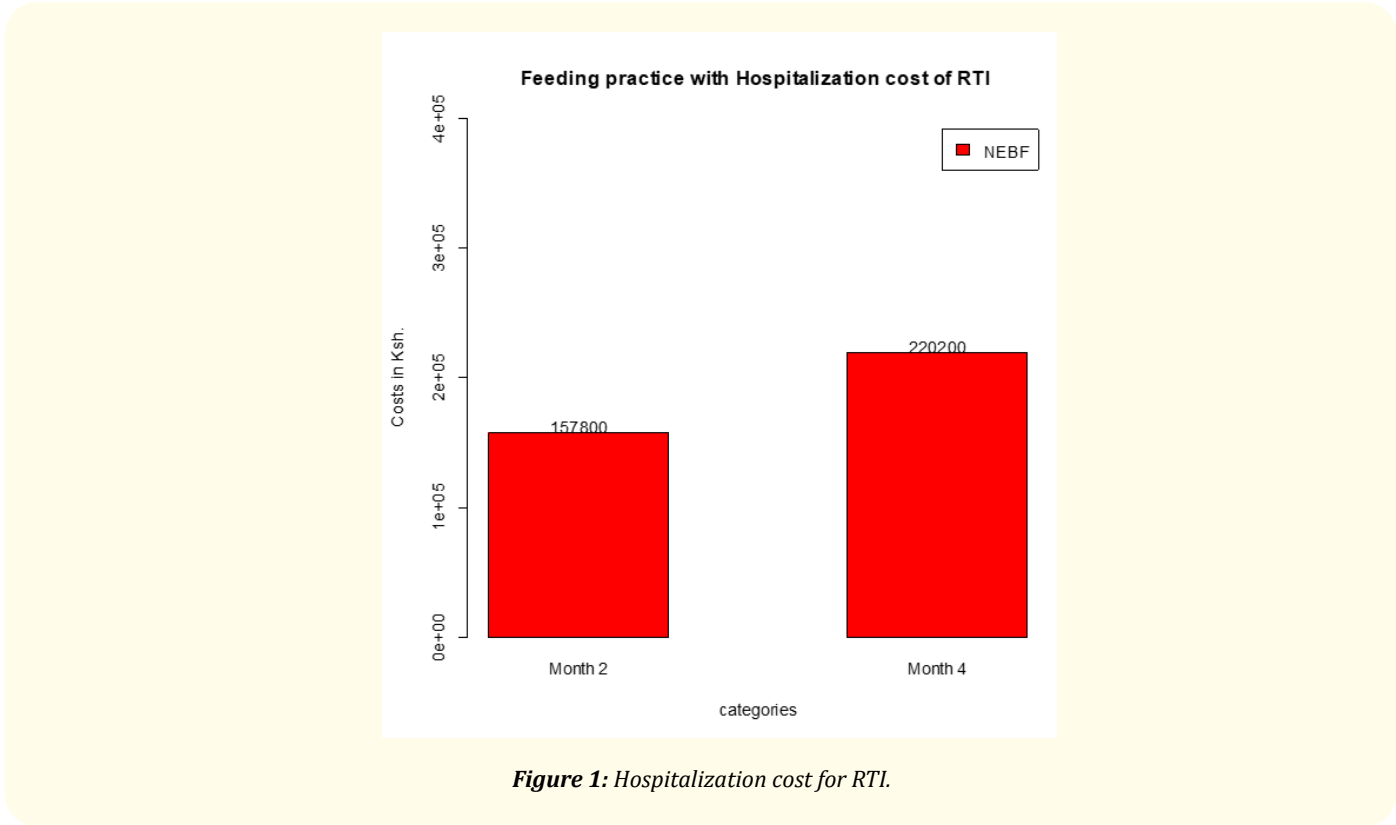


Figure 1: Hospitalization cost for RTI.

From table 3, 220 EBF nurses involved in this study had no expense on the cost of alternative feeding. 215 who had practiced NEBF, on average had spent Ksh. 1,562,500. The data was also analysed using chi-square ($X\text{-squared} = 786750$, $df = 1$, $p\text{-value} < 2.2e-16$), the results indicates a significant association between the feeding practices and cost of alternative feeding.

	Number	Cost	Average
EBF	220	0	0
Total	220	0	0
NON - EBF	55	0 -5,000	137,500
	115	5,001 - 10,000	862,500
	45	10,001 - 15,000	562,500
	0	15,000 and above	0
Total	215		1,562,500

Table 3: The association of feeding practice with cost of alternative feeding Ksh.

From table 4, a total of 2,658,700 Ksh was spent as direct cost to the house holds of the nurses of which 6.8% (181,200 Ksh) and 93.2% (2,477,500 Ksh) was spent by EBF and NONEBF households respectively.

Direct cost of health care to the house hold in Ksh		
	EBF	NON EBF
RTI Consultation cost	47,500	123,000
GE Consultation cost	35,000	116,500
OM Consultation cost	7,500	32,000
RTI Medication cost	50,900	124,900
GE Medication cost	31,800	117,600
OM Medication cost	8,500	23,000
RTI Hospitalization cost	0	378,000
Alternative feeding cost	0	1,562,500
Total Direct cost	181,200	2,477,500
Total Direct cost for EBF and NON EBF	2,658700	

Table 4: Summary of cost of health care.

Discussion

This study found a significant positive correlation between exposed feeding practice and consultation fee for RTI, GE and OM indicating that the more nurses exposed their children to NEBF, then their children stood high chances of suffering from the three diseases hence increasing the cost of RTI, GE and OM consultation fee. This study concurs with that of Mary., *et al.* [1] which revealed that a lot of money would be saved on consultation fee as EBF rates increased in relation to RTI, GE and OM. Approximately £0.3 million per annum could be saved in GP consultation costs by increasing the EBF rate at 4 months (7%) to 21%, £0.8 million per annum at 45% EBF rate and £1.2 million per year at 65% EBF rate for OM cases.

This study found a significant positive correlation between exposed feeding practice and medication cost for RTI, GE and OM indicating that the more nurses exposed their children to NEBF, then their children stood high chances of suffering from the three diseases hence increasing the medication cost for RTI, GE and OM medication fee. This study agrees with a systematic review study by Mary., *et al.* [1] which revealed that a lot of money would be saved on treatment as EBF rates increased in relation to RTI, GE and OM. Economic analysis for GE infections showed that approximately £1.34 million per annum could be saved in treatment costs in hospital by increasing the current EBF rate at four months (7%) to 21%, £3.6 million per annum at EBF rate of 45% and £5.6 million per annum at 65%.

This study found a significant value ($\chi^2 = 10301$, $df = 1$, $p\text{-value} < 2.2e-16$) indicating a significant association between feeding practices and cost of hospitalization. This study agrees with Ball and Wright [16] who found that the estimates given per child for a day of hospitalization \$886.16 for RTI and GE and the mean frequency of hospitalization per 1000 children for RTI were 0.018 for never breastfed, 0.015 for partially breastfed and 0.008 and for EBF.

This study found ($X\text{-squared} = 786750$, $df = 1$, $p\text{-value} < 2.2e-16$) a significant association between the feeding practices and cost of alternative feeding which concurs with Weimer [17] on the economic benefits of breastfeeding also found that infant formula costs the average family in the United States between \$1,200 - \$1,500 annually. According to the United States Department of Agriculture, a minimum of \$3.6 billion in medical expenses per year would be saved if 50 percent of children were breastfed for the first six months.

Conclusion

The health care costs had significant association with feeding practices. On consultation cost, the study found a significant positive relationship between exposed feeding practice and consultation fee for RTI ($r = 0.252$, $p < 0.05$), GE ($r = 0.880$, $p < 0.05$) and OM ($r = 0.479$, $p < 0.05$) indicating that the more the children were exposed, they stood high chance of suffering hence increasing consultation cost. On medication cost, the study found a significant positive relationship between exposed feeding practice and medication fee for RTI ($r = 0.121$, $p < 0.05$), GE ($r = 0.121$, $p < 0.05$) and OM ($r = 0.272$, $p < 0.05$) indicating that the children were exposed, they stood high chance of suffering hence increasing medication cost. On hospitalization cost, the study found a significant association ($\chi^2 = 10301$, $df = 1$, $p\text{-value} < 2.2e-16$) between feeding practices and hospitalization cost. On alternative feeding cost, there was a significant association ($X\text{-squared} = 786750$, $df = 1$, $p\text{-value} < 2.2e-16$) between the feeding practices and alternative feeding cost.

Recommendation

From the study it can be recommended that all lactating working mothers like nurses should be given a six months maternity leave in order to achieve EBF. This will reduce disease incidences and cost of health care.

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