Journal of Nutrition and Health Sciences
Volume 5 | Issue 1
ISSN: 2393-9060

Research Article Open Access

Effect of Father Involvement in Infant Feeding on Nutritional Status and Morbidity in Kisumu, Kenya

Dinga LA*, Kiage BM, and Kyallo FM

Food Science and Technology Department, Jomo Kenyatta University of Agriculture and Technology, Nairobi, Kenya

***Corresponding author:** Dinga LA, Food Science and Technology Department, Jomo Kenyatta University of Agriculture and Technology, 7901-00300 Nairobi, Kenya, Fax : 254-067-52164/52030, Tel : +254 725681922, E-mail: linetaoko@yahoo.com

Citation: Dinga LA, Kiage BM, Kyallo FM (2018) Effect of Father Involvement in Infant Feeding on Nutritional Status and Morbidity in Kisumu, Kenya. J Nutr Health Sci 5(1): 105. doi: 10.15744/2393-9060.5.105

Received Date: November 07, 2017 **Accepted Date:** March 02, 2018 **Published Date:** March 07, 2018

Abstract

Objective: Interventions promoting optimal breastfeeding could prevent 13%, while those promoting optimal complementary feeding could prevent another 6%, of infant deaths in countries with high mortality rates. This study determined the influence of father's participation in promoting infant feeding on nutritional status and morbidity patterns in Kisumu East Sub County, Kisumu County.

Methods: An experimental study was conducted with randomization of study participants into either experimental group or control group with each group having 145 father-mother pairs. Recruitment was done when the mothers to be were 6 months pregnant. Followed up was done until the children birthed reach 12 months of age. No intervention was given in the control group while both husband and wife pairs in the experimental group received nutrition education on breast feeding and complementary feeding.

Results: Overall, more children were wasted, underweight and stunted in the control group than intervention group at 3 months, 6 months and 9 months of age with significantly higher values being observed at 9 months on wasting and underweight (chi-square test; p=0.015 and p=0.010, respectively) in the control group. Statistically significantly higher percentage of children in the intervention group were sick than in the control group (chi-square test; p=0.001) at 3 months. The prevalence of acute respiratory infections was significantly higher among the control group at 3 months (chi-square test; p=0.000).

Conclusion: Nutrition education to fathers impacts positively on infant feeding practices as well as nutritional status.

Keywords: Father Involvement; infant Feeding; Nutritional status; Morbidity; Kenya

Introduction

Under five mortality rates estimated as number of deaths per 1,000 live births is 51 globally, 57 in developing regions and 109 in Sub-Sahara Africa [1]. In Kenya, poor infant feeding practices contribute to more than 10,000 deaths per year [2]. Breastfeeding is critical for child survival, it is the best way of providing young infants with the nutrients they need hence provides a child with the best start to life [3]. Most importantly, it is the most effective preventive health measure for both mother and child. Evidence further indicates that breastfeeding in childhood is associated with intelligence quotient, educational attainment, higher income in adulthood, protection against breast, ovarian cancer, type 2 diabetes, and improved birth spacing among women [4]. Breastfed children have at least six times better chance of survival in the early months than non-breastfed children. An exclusively breastfed child is 14 times less prone to death in the first six months than a non-breastfed child, and breastfeeding drastically reduces deaths from acute respiratory infection and diarrhea, two major child killers [5].

Complementary feeding interventions alone have been estimated to prevent 6% of under five children mortality in developing countries [6]. Inadequate complementary feeding has been shown to have negative impacts on the child increasing infant morbidity and mortality [7,8]. Recommendation are that breastfeeding should be initiated within the first hour of birth, exclusive breast feeding for the first six months of a child's life and introduction of complementary foods at six months with continued breastfeeding into the second year and beyond [2,9]. Poor breastfeeding and complementary feeding practices have been extensively documented in the developing countries. No more than about 39% of infants in the developing countries, 25% in Africa are exclusively breastfed for the first six months [10]. In Kenya, according to Kenya Demographic and Health Survey of 2014, 61% of children under the age of six months are exclusively breastfed with only 21% of children age 6-23 months consuming an acceptable diet [10].

Engagement of men has been shown to significantly improve infant and young child feeding practices [11,12]. Assessments and surveys on infant and young child feeding in Kenya have demonstrated that success in improving infant feeding practices depends on engaging key influencers at the household and community levels. In Kenya, most community programs seeking to improve the well-being of women and children target young mothers and their children with little attention to fathers as key influencers [2]. This study assessed the influence of father's participation in promoting infant feeding on nutritional status and morbidity patterns.

Materials and Methods

Study Design and Setting

The study was a Randomized Control Trial (RCT). The target group was fathers who had pregnant partners between 23 and 27 weeks gestation and attending antenatal clinic at Kisumu county hospital located in Kisumu east sub county, Kenya. The sub county covers an area of 1,960.2 Km^2 and has a population of 544,166 with 3.24% (14,715) being pregnant women and 25.9% (117,629) women of reproductive age. Infant mortality rate is high for Kisumu County at 95/1000 [13]. The main occupation for men living in Kisumu east Sub County is casual labor in the light industries located within the city center. The participants were mainly casual laborers for the men and housewives for the women and their reported age ranged from 16 to 45 years.

Authorization to conduct the study was obtained from the ethics review committee at Kenyatta National Hospital/University of Nairobi, the County Director of Health in Kisumu and the medical superintendent at Kisumu county hospital. The respondents were informed of the objectives of the study and the interviewer sought their consent to participate in the study. All information and conversations provided to the investigators by the participant was regarded as confidential.

Sampling

The study group for quantitative data collection was identified through the pregnant women who were selected through systematic random sampling at Kisumu County hospital. Calculation of the sample size was done using the formula below. The study considered an effect size of 20% based on the intervention of nutrition education targeting both father and mother to be done since the outcome was expected to be better than that of a similar study done in Turkey which considered difference in effect of intervention of 15% and used standard deviation of 0.58 [11].

$$n = \frac{2\left(Z_\alpha + Z_{1-\beta}\right)^2 \sigma^2}{\Delta^2}$$

Where:
n- Estimated sample size
Z_α level of significance (set at 0.95 α=0.05=1.96); $Z_{1-\beta}$ power of the study (80%)
Σ standard deviation (estimated at 0.58)
Δ difference in effect of interventions which is required (estimated at 20% based on previous studies)

Hence

$$n = \frac{2\left(1.96\ +\ 0.8416\right)^2 \left(0.58\right)^2}{\left(0.20\right)^2}$$

n=132. Considering a 10% attrition rate, the total sample size was 145 this figure was doubled to 290 since the intervention study would involve an experimental and control group.

A total of 290 husband and wife pairs were recruited. Ten participants were recruited per day from those who agreed to take part in the study from a daily attendance to antenatal clinic of 75 pregnant women with an approximation of 40% being 6 months pregnant according to the hospital profile. The recruited study participants were linked to the fathers to participate in the study.

In addition, FGD was conducted with 6 fathers and mothers who were engaged in the study. There was 2 FGD engaging control group and 2 FGD engaging intervention group participants. Participants were randomly selected from the randomized group of husband and wife pair.

Inclusion and exclusion criteria

Inclusion was of: women who were 6 months (23-27 weeks) pregnant and attending antenatal clinic at Kisumu County hospital at the time of recruitment; women who are from Kisumu east sub county; women who are planning to breast feed; male partners of the pregnant women and who are willing to be visited at home. Exclusion was of: women who were 6 months pregnant and attending antenatal clinic at Kisumu County hospital but are not from Kisumu east Sub County; women not planning to breast feed; and women with documented chronic diseases or are very ill.

Intervention

Baseline data was collected from the husband and wife pairs at time of enrollment from both the experimental and control group. Data collected include: demographic information such as age, level of education and household size; socio-economic status such as occupation and pregnancy related characteristics such as age of pregnancy at first ANC attendance and parity. Nutrition education was provided in the form of group facilitated sessions to the experimental group. The husband and wife pairs in the experimental group received nutrition education sessions prenatally on breast feeding and complementary feeding. At the end of the sessions a leaflet with the main points of the session was provided to the participants.

Data Collection and Analysis

Data on nutritional status and morbidity for the children was collected progressively using semi-structured questionnaires. The nutritional status data was collected four times: at birth, at 3 months, at 6 months and at 9 months. Data was recorded from the child's clinic card on weight and length corresponding to the different time lines. Measurements of length were recorded to the nearest 0.5cm. Measurements of length were recorded to the nearest 0.1kg. Data on morbidity was collected using the questionnaire. Any morbidity that has been experienced by the child was recorded during the three month period under assessment.

Data was field edited, coded and entered into SPSS version 21 and cleaned before analysis. Descriptive statistics and comparison between groups was performed by means of the chi-square test. The child nutritional status was analyzed using WHO anthro and interpreted using the Z- Score [14]. Children with a Z-score of below -2SD for weight-for-age (WFA), weight-for-height (WFH) and height-for-age (HFA) were considered underweight, wasted and stunted, respectively. Those above -2SD were considered normal or well-nourished [14].

Study Results

Characteristics of Study Group

A total of 290 father-mother pair was reached for quantitative data collection. Randomization of the study groups was successful; the two study groups were similar in all aspects with the exception of one variable, namely parity (p=0.000) (Table 1 and Table 2).

Characteristic		Control group (N=145)	Intervention group (N=145)	Chi-square x^2	*p*
Education				2.34	0.31
	Father				
	Primary level	39.3 (57)	37.2 (54)		
	Secondary level	47.6 (69)	54.5 (79)		
	College level	13.1 (19)	8.3 (12)		
	Mother			4.29	0.12
	Primary level	42.1 (61)	53.8 (78)		
	Secondary level	48.3 (70)	40 (58)		
	College level	9.7 (14)	6.2 (9)		
Occupation	Father			7.50	0.11
	Self-employment	31.8 (46)	33.7 (49)		
	Formal employment	20 (29)	25.5 (37)		
	Casual employment	48.3 (70)	40.7 (59)		
	Mother			2.39	0.67
	Stay at home/housewife	44.1 (64)	48.3 (70)		
	Self-employment	37.9 (55)	33.1 (48)		
	Formal employment	6.2 (9)	9 (13)		
	Casual employment	**11.7 (17)**	**9.7 (14)**		
Household size			3.58	0.17	
	1-3	49.7 (72)	59.3 (86)		
	4-6	46.2 (67)	38.6 (56)		
	7 and above	4.1 (6)	2.1 (3)		
knowledge of pregnant mother about breastfeeding					
	Knows mothers milk is the first feed	97.9 (142)	94.5 (137)	2.03	0.36
	Knows about initiating of breastfeeding within 1hr	59.3 (86)	63.4 (92)	2.57	0.17
	Knows children should be breastfed for 2 years or more	57.2 (83)	61.4 (89)	3.28	0.55
	Knows about exclusive breastfeeding for six months	43.4 (63)	42.3 (58)	1.17	0.56

*Significant differences (Chi-square test p<0.05)

Table 1: Baseline Comparison of key demographic, socio-economic, perinatal and knowledge traits for the study groups

A statistically significant higher mean (1.75±1.49) of number of children birthed was observed among the study participants from the control group than the intervention group (1.16±1.12).

Characteristic	Control group n=145 M(SD)	Intervention group n=145 M(SD)	*One way ANOVA F*	*p*
Age				
Father	29.45 (5.7)	30.74 (6.6)	3.20	0.08
Mother	24.57 (4.7)	24.6 (4.3)	0.01	0.92
Perinatal-related characteristics				
Gestational age 1st ANC visit (months)	4.51 (1.5)	4.19 (1.5)	3.03	**0.07**
No. of ANC visits	1.93 (0.83)	1.96 (0.85)	0.08	0.78
Parity	1.16 (1.12)	1.75 (1.49)	14.62	0.00**

Note *p<0.05; **p=< .01

Table 2: Baseline Comparison of age and perinatal traits for the study groups (N=290)

Infant Feeding Practices

Majority (74.3% n=208) of the mothers initiated breastfeeding within an hour after birth. Initiation of breastfeeding within an hour of birth was significantly higher among the intervention group (97.1% n=134) than the control group (52.1% n=74); (x^2=8.89; 95% CI: 4.47–4.54; p=0.000). Exclusive breastfeeding rates at 6 months was also significantly higher in the intervention group (77.7% n=101) than in the control group (45.1% n=64) (x^2=9.58; 95% CI: 6.67–6.78; p=0.000). Higher prevalence of exclusive breastfeeding was noted in the intervention group among mothers who had involvement and support from the father (73.4% n=116) compared to mothers in the control group (60.2% n=62). The kind of support provided by fathers in the intervention group include: motivation and support to continue breastfeeding, holding the baby, taking care of older children and doing other household chores. Fathers felt by giving this kind of support the mother was less stressed and able to concentrate on breastfeeding. The kind of support provided by the fathers in the control group mostly included provision of basic needs [15-18].

Based on a 24-hour recall, majority (63.4% n=184) of the children had been introduced to solids, semi-solids and soft foods at 6 months. Complementary foods were introduced significantly earlier in the control group than in the intervention group (x^2=5.87; 95% CI: 1.15–1.31; p=0.000). In the intervention group, majority of the children at 6-8 months old and 9-12 months old had attained the recommended minimum meal frequency of 2 times and 3 times per day at 96.9% (n=123) and 92.4% (n=109) respectively. In the control group, fewer children at 6-8 months old and 9-12 months old had attained the recommended minimum meal frequency of 2 times and 3 times per day at 83.3% (n=105) and 70.9% (n=94) respectively. Minimum meal frequency was higher in the intervention group than control group (x^2=7.16; 95% CI: 5.39–5.48; p=0.000).

Minimum dietary diversity was established based on the number of food groups the index child consumed in the previous 24 hours prior to the data collection. Seven food groups as recommended internationally by WHO [19]. Children of 6–12 months of age who receive foods from 4 or more food groups are considered to have a diverse diet [19]. There was a significant difference ((x^2=11.01; 95% CI: 8.41 – 8.64; p=0.022) in the dietary diversity score of the intervention group and control group at 6-8 months but there was no significant difference (x^2=2.11; 95% CI: 1.31–1.40; p=0.10) in the dietary diversity score of the intervention group and control group at 9-12 months. Mothers in the intervention group were twice more likely (OR = 2.09; 95% CI: 1.72–2.54; p=0.000) to have minimum acceptable diet compared to the mothers in the control group. The indicators for minimum acceptable diet by study group for the children at age 9-12 months are summarized in Figure I.

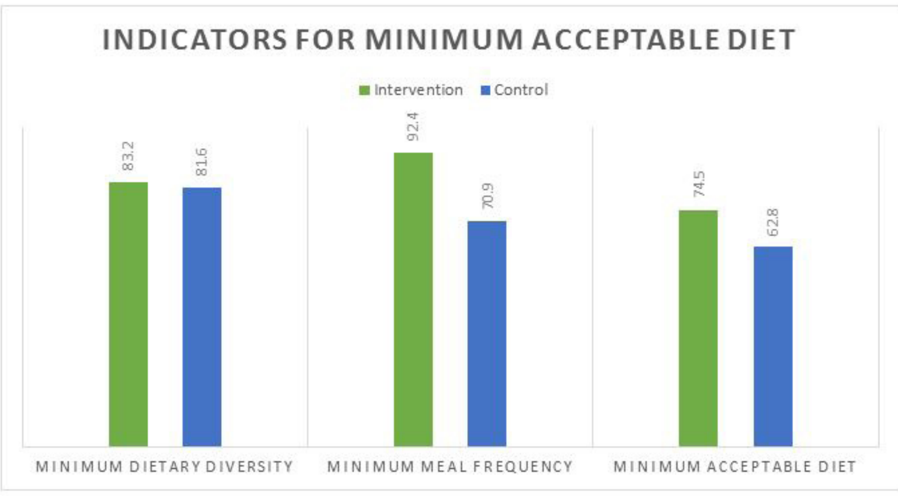

Figure 1: Indicators for minimum acceptable diet

Follow up was made on fathers support to the mother during complementary feeding. More mothers in the intervention group (94.2% n=113) cited receiving support from the father than the control group (45% n=59). The kind of support provided by fathers include: motivation and information on infant feeding, purchase of food for the baby, preparation of food for the baby, holding the baby, taking care of older children and doing other household chores. Fathers felt confident in playing these roles based on the information they were provided with on infant feeding.

Nutritional Status of the Children

Nutritional status was based on anthropometric assessment of the infants which was determined using the indices weight-for-age, height-for-age and weight-for-height; underweight, stunting and wasting respectively. It was interpreted using the WHO Child Growth Standards [14]. Overall, more children were wasted, underweight and stunted in the control group than intervention group at 3 months, 6 months and 9 months of age with significantly higher values being observed at 9 months on wasting and underweight in the control group. Table 3 shows prevalence of stunting, wasting and underweight by time and group.

Variable	Intervention group (N=145)	Control group (N=145)	x^2	*Chi-square*	*P*	95% CI
3 months old						
Stunting (<-2 z score)	7.6% (11)	13.8% (20)	6.11		0.087	1.23-1.33
Wasting (<-2 z score)	3.4% (5)	5.5% (8)	0.61		0.395	0.91-1.01
Underweight (<-2 z score)	2.8% (4)	4.1% (6)	0.83		0.520	0.97-1.08
6 months old						
Stunting (<-2 z score)	11.7% (17)	19.3% (28)	4.52		0.074	1.10-1.21
Wasting (<-2 z score)	4.8% (7)	6.9% (9)	0.37		0.453	0.89-0.93
Underweight (<-2 z score)	4.1% (6)	6.2% (9)	0.58		0.426	0.76-0.82
9 months old						
Stunting (<-2 z score)	9.7% (14)	13.1% (19)	0.51		0.355	0.69-0.75
Wasting (<-2 z score)	2.8% (4)	9.7% (14)	6.56		0.015*	1.24-1.35
Underweight (<-2 z score)	2.1% (3)	9% (13)	5.09		0.015*	1.42-1.49

*Significant differences (Chi-square test p<0.05)

Table 3: Prevalence of malnutrition by age, group and sex

Relationship between Infant Feeding Practice and Nutritional Status

Assessment of the relationships between child nutritional status (wasting, underweight and stunting) and infant feeding practice in terms of initiation of breastfeeding, exclusive breastfeeding, minimum dietary diversity, minimum meal frequency and minimum acceptable was done. Children who had consumed fewer meals in a day than recommended by WHO were more likely to be wasted and underweight than those who were fed the minimum meal frequency as per WHO recommendations (x^2=6.03; 95% CI: 1.17–1.34; p=0.004 and x^2=7.11; 95% CI: 2.27–2.54; p=0.000 respectively). Children who had not consumed a diverse diet were also more likely to be wasted than those who had consumed a diverse diet ((x^2=3.45; 95% CI: 4.22–4.44; p=0.007). In addition, children who had not consumed the minimum acceptable diet in terms of both meal frequency and dietary diversity were more likely to be wasted and underweight ((x^2=8.01; 95% CI: 1.07–1.24; p=0.001 and x^2=4.13; 95% CI: 7.17–7.28; p=0.000 respectively). However, a chi-square test did not reveal a significant relationship between initiation of breastfeeding, exclusive breastfeeding and child nutritional status.

Morbidity Patterns of the Children

Information on infant morbidity status was based on a two-week recall and data collected from the caregivers during months 3, 6 and 9 of the infants. At 3 months, 49.4% of the infants in the control group and 31.1% in the intervention group were reported sick (x^2=2.17; 95% CI: 1.98–2.10; p=0.001). Acute respiratory infections affected 41.8% of the infants in the control group and 20.5% in the intervention group (x^2=2.04; 95% CI: 1.86–1.93; p=0.000). The differences of having diarrhea and fever between the intervention and control group were insignificant (x^2=10.10; 95% CI: 6.28–6.39; p=0.245 and x^2=5.13; 95% CI: 1.27–1.47; p=1.000 respectively).

At 6 months, 44.9% of the infants in the control group and 34.7% in the intervention group were reported sick (x^2=2.33; 95% CI: 5.32–5.46; p=0.154). Significant differences were observed between the intervention and control group in terms of prevalence of diarrhea, ARI and fever (x^2=6.12; 95% CI: 1.68–1.84; p=0.015, x^2=8.11; 95% CI: 1.57–1.77; p=0.050 and x^2=1.09; 95% CI: 1.97 –2.14; p=0.030 respectively). At 9 months, 42.7% of the infants in the control group and 49.2% in the intervention group were reported sick (x^2=2.10; 95% CI: 2.26–2.44; p=0.188). Fever affected 8.4% of the infants in the control group and 18.3% in the intervention group (x^2=1.53; 95% CI: 4.27–4.34; p=0.025). The differences of having diarrhea and ARI between the intervention and control group were insignificant (x^2=4.51; 95% CI: 1.25–1.41; p=1.000 and x^2=9.01; 95% CI: 1.72–1.94; p=0.881 respectively).

Discussion

At baseline level, the intervention and control group were similar in almost all aspects. All the fathers who were engaged in this study were in a form of relationship with the expectant mother. Fathers in a stable relationship create an environment of safety and comfort which can be transmitted on to the mother and eventually represent a reason for success in infant feeding practices and her confidence in the role of a mother [20]. Regarding father's schooling, it was noted that majority had above primary level education. The educational level of the father has been linked as a positive factor in paternal support towards infant feeding [21]. A randomized controlled trial showed that exposing expectant fathers to a 2-hour intervention class on infant feeding was successful in improving infant feeding practices [22]. This education is recommended to take place during the antenatal period and the baby's first quarter [23]. In our study, the fathers and mothers in the intervention group went through a 2 hour education session on breastfeeding and complementary feeding during the antenatal period.

Majority of the infants in the study had a normal weight-for-age, length-for-age and weight-for-length z-scores. Overall, stunting rates were higher than underweight and wasting rates in both groups similar to findings of the Kenya demographic health survey in which more children were stunted than wasted and underweight in Kisumu County [10]. In our study, under nutrition was observed in the infants as early as at 3 months of age. This was similar to results from a Malawian study which showed that infants that were commenced early on complementary feeds progressively had lower weight for age from as early as 2 months, validating the benefit of exclusive breastfeeding [7].

In the present study, nutritional status was poor in children who had fewer meals and less diverse diets especially at 9-12 months of age. Indeed, it is at this age that significantly more children in the control group were found to be wasted and underweight. Hence the differences in the nutritional status in the intervention and control group could be attributed to the increased knowledge received by the fathers on infant feeding and consequently better involvement in infant feeding. Moreover, the importance of male involvement in health and nutritional matters has been emphasized in other studies [24,25].

Based on our study, less children in the intervention group had morbidities such as diarrhea, ARI and fever compared to children in the control group. It appears that nutrition education provided to the fathers in the intervention group could have played a positive role in ensuring children in the intervention group were fed as per WHO recommendations and consequently experienced less episodes of disease. Exclusive breastfeeding rate was significantly higher in the intervention group than in the control group in our study. Lower morbidity and mortality from diarrhea as a result of exclusive breastfeeding has been reported in various studies too [26,27]. In fact non-exclusively breastfed infants had a significantly higher prevalence of diarrhea in our study compared to exclusively breastfed infants which is in agreement with scientific evidence from Bangladesh which found out that infants exclusively breastfed for six months had a significantly lower 7-day prevalence of diarrhea than infants who were not exclusively breastfed [28].

In our study, better infant feeding practices were observed in the intervention group where mothers had reported receiving more paternal support and consequently better nutrition outcomes were observed. Research has demonstrated positive impact on child nutritional outcome with paternal involvement. In fact, a Vietnamese study showed that children whose fathers were not involved in taking them to the health facility for immunizations were about 1.7 times more likely to be malnourished which indicate the need for paternal involvement in child health care system in general and nutritional outcome in particular [29]. Similarly, a study done in South Africa reported children whose fathers did not provide their family with financial support were found to be at higher risk of malnutrition [30]. A Peruvian study reported lower height-for-age Z-scores among children who did not see their fathers regularly during their infancy compared to children who saw their fathers regularly, after adjusting for other contextual factors [31]. Furthermore, a sub-Saharan Africa study found higher odds of stunting among children of single mothers compared to children whose mothers were in union [32]. These studies indeed validate the importance of male involvement in the wellbeing of the child.

We therefore conclude that providing nutrition education to fathers during the antenatal period improves infant feeding practices and subsequently nutritional status of the child. Fathers need to be provided with more guidance from the health system and professionals. In fact, fathers should be included in education sessions on infant feeding at the health facility and community levels, all of which may be an important step in the survival and development of the child.

Acknowledgement

We wish to thank all the fathers and mothers who participated so enthusiastically in this work. All authors read and approved the final manuscript. We acknowledge funding from German Academic Exchange Service (DAAD).

References

1. IGME (2012) Levels and trends in child mortality, New York: United Nations Children Fund, 2012.

2. Ministry of Health (MOH) (2010) National Strategy of Infant and Young Child Feeding 2007-2010, Kenya: WHO/UNICEF, 2010.

3. WHO (2013) Essential Nutrition actions: improving maternal, newborn, infant and young child health and nutrition. WHO, Geneva.

4. Victora CG, Bahl R, Barros A.J, Franca GV, Horton S, et al. (2016) Breastfeeding in the 21st century: epidemiology, mechanisms, and lifelong effect. Lancet 387 475-90.

5. Black RE, Allen LH, Bhutta ZA, Caulfield LE, de Onis M (2008) Maternal and child under-nutrition: global and regional exposures and health consequences. Lancet 371: 243-60.

6. Black RE, Victora CG, Walker SP, Bhutta ZA, Christian P (2013) Maternal and child under-nutrition and overweight in low income and middle income countries. Lancet 382: 427-51.

7. Kalanda BF, Verhoeff FH, Brabin BJ (2006) Breastfeeding and complementary feeding practices in relation to morbidity and growth in Malawian infant. Eur J Clin Nutr 60: 401-7.

8. Edmond KM, Zandoh C, Quigley MA, Amenya-Etego S, Owusu-Agyei S et al. (2006) Delayed breastfeeding initiation increases risk of neonatal mortality. Pediatric 117: 380-6.

9. WHO (2010) Indicators for assessing infant and young child feeding practices part II: Country profiles. World Health Organization, Geneva 2010.

10. Kenya National Bureau of statistics (KNBS) and ICF Macro (2014) Kenya Demographic and Health Survey 2010-2014, Kenya: Calverton, Maryland: KNBS and ICF Macro 2014.

11. Pisacane A, Continisio GI, Aldinucci M, D'Amora S, Continisio P (2005) A controlled trial of the father's role in breastfeeding promotion. Pediatrics 116: e494-8.

12. Susin LR, Giugliani ER (2008) Inclusion of fathers in an intervention to promote breastfeeding: impact on breastfeeding rates. J Hum Lact 24: 386-92.

13. Republic of Kenya (2012) Kisumu County strategic plan 2013-2018, Nairobi, Kenya: Ministry of state for planning, National Development and Vision 2030, 15-35.

14. WHO (2006) WHO child growth standards: Length/height-for-age, weight-for-age, weight-for-length, weight-for-height and body mass index-for-age: Methods and development. World Health Organization, Geneva, 2006.

15. CARE (2010) Infant and Young Child Feeding Practices: Collecting and Using Data-A step-by-step guide, USA: CARE USA.

16. Dicken K, Griffiths M, Piwoz E (1997) Designing by dialogue: A program planner's guide to consultative research for improved young child feeding. Support for analysis and research in Africa project, Washington DC: Academy for Educational Development.

17. Thuita FM (2008) Infant and Young Child Feeding Practices in Kenya: A review of the literature. PATH, NAirobi, Kenya, 2008.

18. Martin S, Mukuria A, Maero P (2009) Engaging men to increase support for optimal infant feeding in Western Kenya. USAID, Kenya.

19. Tohotoa J, Maycock B, Hauck YL, Howat P, Burns S (2009) Dads make a difference: an exploratory study of parental support for breastfeeding in Perth, Western Australia. Int Breastfeed 4: 15.

20. Piazzalunga CR, Lamounier JA (2009) The partenity and its influence on breastfeeding. Pediatria 31: 49-57.

21. Robert E, Coppieters V, Swennen B, Dramaix M (2015) Determinants of breastfeeding at maternity in Brussels. Rev Med Brux 36: 69-74.

22. Wolfberg AJ, Michels KB, Shields W, O'Campo P, Bronner Y (2004) Dads as breastfeeding advocates: results from a randomized controlled trial of an educational intervention. Am J Obstet Gynecol 19: 708-12.

23. Maycock B, Binns CW, Dhaliwal S, Tohotoa J, Hauck Y (2013) Education and support for fathers improves breastfeeding rates: a randomized controlled trial. J Hum Lact 29: 484-90.

24. Johansson M, Nyirenda J, Johansson A, Lorefalt B (2011) Perceptions of Malawian nurses about nursing interventions for malnourished children and their parents. J Health Popul Nutr 29: 612-8.

25. Saha KK, Bamezai A, Khaled A, Subandoro A, Rawa R, et al. (2011) Alive and thrive baseline survey report: Bangladesh. Alive and Thrive, Washington DC, 2011.

26. Bhandari N, Bahl R, Mazumdar S, Martines J, Black RE, et al. (2003) Effect of community-based promotion of exclusive breastfeeding and diarrheal illnesses and growth: a cluster randomized control trial. Lancet 361: 349-50.

27. Jones G, Steketee RW, Black RE, Bhutta ZA, Morris SS, et al. (2003) How many child deaths can we prevent this year? Lancent 362: 65-71.

28. Mihrshahi S, Oddy WH, Peat JK, Kabir I (2008) Association between infant feeding patterns and diarrhoeal and respiratory illness: A cohort study in Chittagong, Bangladesh. Int Breastfeed J 3: 28.

29. Tran BH (2008) Relationship between parental involvement and child malnutrition in a rural area of Vietnam. Food Nutr Bull 29: 59-66.

30. Madhavan S, Townsend N (2007) The social context of children's nutritional status in rural South Africa.," Scand J Public Health Suppl 69 107-17.

31. Dearden K, Crookston B, Madanat H, West J, Penny M (2013) What difference can fathers make? Early paternal absence compromises Peruvian children's growth. Matern Child Nutr 9: 143-54.

32. Ntoimo LF, Odimegwu CO (2014) Health effects of single motherhood on chikdren in Sub-Sahara Africa: a cross-sectional study. BMC public health 14: 1145.