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EFFECT OF PATERNAL EDUCATION ABOUT COMPLEMENTARY FEEDING OF INFANTS IN KISUMU COUNTY, KENYA

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ABSTRACT

Improved health of infants is dependent on the supportive role of the fathers. There is limited research done in Kenya on father involvement and how it affects feeding practices of the infant. The objective of this study was to evaluate the impact on complementary feeding practice of nutrition education targeted to the father. A randomized control trial was conducted with 290 father-mother pairs recruited into the study. The mothers, who were six months pregnant and receiving antenatal services at Kisumu County Hospital, provided the contact point for recruitment of the fathers who were engaged in this study. The consenting mothers provided information of the 'expectant father' who were later contacted and invited to go to the hospital together with the mother. Consent was obtained from the study participants in a written form. Randomization was done to the father-mother pairs and eventually, each group had 145 pairs. The pairs in the intervention group were educated on complementary feeding while the other pairs in the control group did not get any intervention. Post-natal, feeding on solids and semi-solids of the infants were assessed at six months and at nine months of age. Qualitative assessment through focus group discussions were done to obtain information on fathers' support towards complementary feeding. Overall analysis was done on 278 pairs with 12 lost to follow up. Introduction to solids and semi-solids had been done by a majority (96.7%) by six months of the infant's age in both groups. Solid and semi-solid foods were introduced significantly earlier in the control group and compared to the intervention group (chi-square test; $p<0.01$). Minimum acceptable diet was significantly higher in the intervention group than the control group (chi-square test; $p<0.01$). In conclusion, giving fathers information on complementary feeding influences their support towards infant feeding, resulting in positive outcomes in complementary feeding practices.

Key words: Father, Involvement, Infant, Complementary feeding, Nutrition Education, Kisumu, Kenya

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INTRODUCTION

Mortality rates among children under five stood at 51 worldwide, higher in developing countries at 57, and highest in sub-Saharan Africa at 109 [1]. In Kenya, poor feeding of infants accounts for over 10,000 deaths per year [2]. According to the Lancet series of 2013, 6% of deaths in developing countries could be averted through complementary feeding interventions alone [3]. Complementary feeding is the provision of solid and semi-solid foods in addition to breast milk to children over 6 months of age [4]. Timely introduction of appropriate complementary foods has been linked to good nutritional status and adequate growth in infants [5]. Negative outcomes are associated with inappropriate complementary feedings such as retarded growth, [6] low mental development [7] and an increase in infant morbidity [8] and mortality [9].

Fathers giving support practically or emotionally to the mother is recognized as key for improved infant nutrition. Health structures are seen as important avenues to support actualization of the provision of this support by the fathers [10]. Engagement of fathers is vital because of the significant provision of physical and psychosocial support to the mother during the weaning period as well as the overall well-being of the mother and the family [11].

Fathers' participation in child-care is positively linked to developmental, cognitive, social and behavioral child outcomes in addition to improved breastfeeding practice [12]. The Kenyan Government developed a national strategy in 2007 which aimed to promote infant feeding practices optimally [13]. The strategic document outlines the father's role in infant feeding that includes involvement in making decisions on infant feeding, providing support physically, psychologically and financially to the breastfeeding mother [13]. Limited research looking at fathers' engagement in infant feeding has been undertaken in Kenya despite the existence of evidence that has shown fathers as influential on the feeding process [14]. This study aimed to evaluate the impact on complementary feeding practice of nutrition education targeted to the father.

METHODOLOGY

Study design and setting

The study design was a randomized control trial. The study was conducted on the Eastern part of Kisumu County with an area of almost 2,000 Km² and a population of half a million. From the total population, almost 3% are pregnant women and a quarter are women of reproductive age [15]. Kisumu County was chosen based on the high mortality rate of infants compared to the national levels at 50 deaths/1,000 live births against 39 deaths/1,000 live births [16].

The mothers, who were six months pregnant and receiving antenatal services at Kisumu County hospital, provided the contact point for recruitment of the fathers who were engaged in this study. The father-to-be connected to the 'expectant mother' identified at the antenatal clinics were later contacted on the phone if they had not accompanied the mother to the clinic. A specific date was assigned to the father-mother pairs to meet with the study team at the health facility. During the meeting date, informed consent was

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obtained in a written form from the pairs. Simple random sampling was used to assign the father and mother pairs into the different groups by picking papers from a bowl indicating either of the groups. Authorisation to undertake the study was granted by the Ethics Review Committee at Kenyatta National Hospital in partnership with the University of Nairobi, Kenya on 28/10/2015 registered as P533/08/2015.

Sampling

An exhaustive sampling of all pregnant women meeting the selection criteria between January and April 2016 was used. Overall, 10 mothers were selected daily. Sample size calculation was guided according to Johnson *et al*. [17]. Based on the expectation of better outcomes from our study than that of a previous study done in Turkey which used 15% effect size and a standard deviation of 0.58, a 20% effect size was considered [18]. The study in Turkey had provided the nutrition education to the fathers postnatal, while our study provided it prenatally with the expectation that the father-mother pair receiving the intervention will be able to make an early informed decision which would influence on the feeding practice.

The total sample size calculated was 145, allowing for a 10% attrition rate. Thus, each group had 145 father-mother pairs to be sampled. Among those assigned to the intervention and control group, 8 fathers and 8 mothers were selected randomly from each group for the focus group discussions (FGD) pre and post intervention.

Inclusion and exclusion criteria

Those included in the study were pregnant women (23-27 weeks gestation) seeking antenatal services from Kisumu County Hospital, women residing in Kisumu East Sub County, women living together with the father of the expected child, mothers with the intention to breastfeed and willingness of participation by the 'expectant father'. Those excluded from the study were pregnant women not residing in Kisumu East Sub County, women not living together with the 'expectant father', and pregnant women who were very sick or with known chronic illnesses.

Intervention

Formative assessment was conducted to collect baseline data from both study groups to determine their comparability. Demographic characteristics including age, level of education, and household size were recorded in the semi-structured questionnaires. Data on livelihood, antenatal clinic visit frequency, and parity were collected. The nutrition education sessions were done by 3 trained nutritionists in 4-hour group sessions targeted to the fathers and mothers in the intervention group prenatally. The sessions focused on benefits of breastfeeding, the varieties of foods for children, ensuring adequate amount and consistency per age category and father participation (provision of the required foods, how to prepare the foods, responsive feeding, reminding and motivating the mother on the key recommendations). A pamphlet summarizing the key messages from the sessions was given to the fathers and mothers at the end of the sessions.

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Data collection

Pre-testing of the semi-structured questionnaire was done in Osiri, which is in Kisumu West Sub County, through a cross-sectional survey reaching thirty fathers and mothers who had children aged below one year. The sample for the pre-test was as a result of taking 10% of the total study sample which was 290. Data was collected within one week of the infants' 6th month and 9th month birthday with the indicators aligned with the World Health Organization (WHO) guidelines [19]. Data was collected at the time of introduction of complementary foods, meal frequency and diversity of the diet given to the infant using the pre-tested questionnaires. Data on infant feeding knowledge and father support was also collected.

Qualitative data was collected through FGDs using a discussion guide on complementary feeding with a focus on what are the challenges, beliefs, and practices on infant feeding within the community. The FGDs were moderated by the principal investigator with assistance from the research assistants who are trained nutritionists. The data collected was recorded using the phone and transcribed.

Statistical analysis

The questionnaires were reviewed in the field after data collection to ensure it was complete and accurate. Variables that were analyzed and compared between the intervention and control group included the timely introduction of complementary foods, minimum meal frequency, minimum dietary diversity, minimum acceptable diet and father's support towards complementary feeding. Descriptive analysis was done for the socio-demographic data. The chi-square test was used for testing relationships between the categorical variables. Complementary feeding variables analyzed include varieties of food given [20], the frequency of feeding [21], and timeliness of introduction of solids and semi-solid. Qualitative data collected from FGD were transcribed and put into emerging themes then used to interpret the quantitative variables.

STUDY RESULTS

The study groups were compared at baseline. The number of children birthed was the only characteristic that differentiated the groups X^2=14.04, p<0.001) (Table 1). Overall, 278 father and mother pairs were analyzed with the attrition of 12 father and mother pairs from both groups due to the death of the child, father and mother parting ways and vacating from the study location. Timely introduction of complementary foods at 6 months of age was 63.4%. Timely introduction of solids and semi-solid foods was significantly earlier in the intervention group x^2 =5.87, p<0.01.

Results from the qualitative assessment revealed the causes of the untimely introduction of solid and semi-solid foods by the control group as feeling that the infant was ready to begin taking other foods, and reduction in the quantity of breast milk. In the intervention group, going back to work was the main reason for the lack of timely introduction of complementary foods. Both groups cited relentless crying of the infant as a contributor in communities encouraging feeding on solid and semi-solid foods early to the infant before 6 months of age. A majority (92.4%) of the infants had attained the recommended

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minimum meal frequency at 9 months of age compared to 70.9% in the control group. Minimum meal frequency was significantly higher for the intervention group x^2 =7.16, p<0.01.

Majority (86%) of the infants had attained the minimum food diversity at 9 months of age (Table 2). However, no significant differences were found in the dietary diversity score of the study groups at 9 months of age x^2 =2.11, p=0.10. Significantly more infants were fed on eggs in the intervention group, at 9 months, than those in the control group x^2 =25.74, p=0.01 (Table 3). Findings from the qualitative data show that beliefs around hindrance of speech when eggs are consumed is a major reason for infants not being fed on it. Majority of the infants had achieved both minimum meal frequency and diversity at 9 months of age in the intervention group and the control group at 74.5% and 62.8%, respectively. Significantly more infants had attained the minimum acceptable diet in the intervention group than the control group x^2 =22.51, p<0.01 (Figure 1).

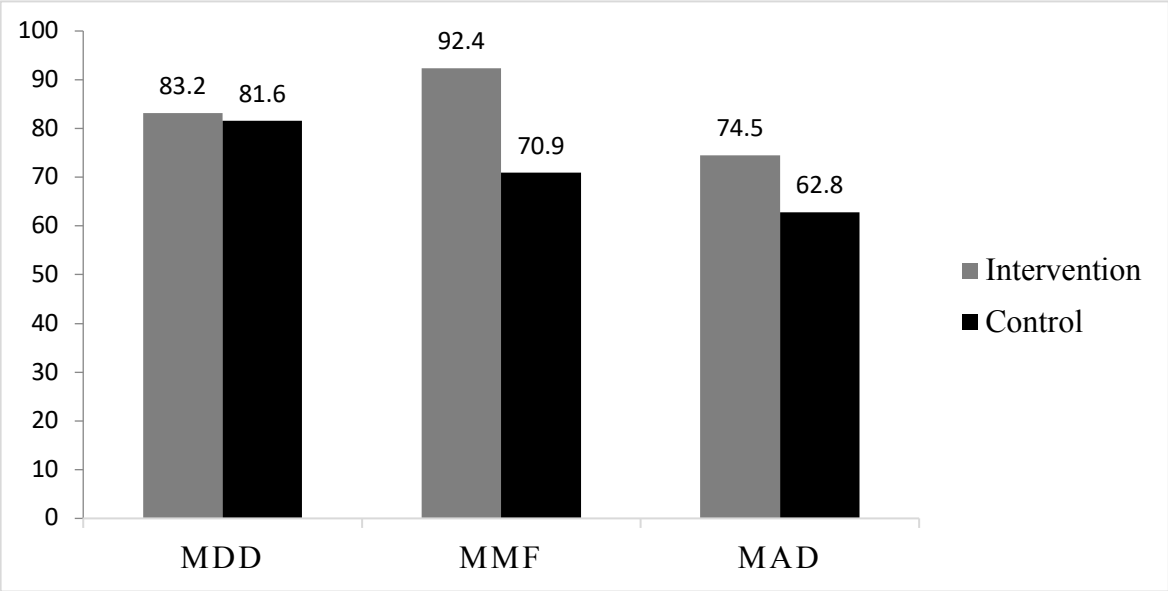

Figure 1: Levels of minimum acceptable diet at 9 months of age (MDD-Minimum acceptable diet, MMF-Minimum Meal Frequency, and MAD-Minimum Acceptable Diet)

In the intervention group, a majority (94.2%) of the mothers reported receiving support from the father on complementary feeding compared to almost half (45%) of the mothers in the control group (Table 4). The odds of attaining minimum acceptable diet in the intervention group was twice that in the control group (OR = 2.09; 95% CI: 1.72 – 2.54; p=0.00). Multiple regression analysis was performed on variables that had shown significance to assess prediction of attainment of minimum acceptable diet between the intervention and control group. Significant contributions to the regression model was made by support from fathers on the decision to the time of introduction of complementary foods, (p=0.02), decisions on meal frequency, (p=0.01), decisions on food diversity, (p=0.03) and providing the mother with appropriate information about complementary feeding (p<0.01). The regression equation was significant F = 35.03, p=.01, with an R^2 of 0.72 (Table 5).

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DISCUSSION

The father and mother pairs who participated in our study were living together. A study showed that when fathers and mothers are in a form of union with the mother, a breastfeeding-friendly home environment is created [22]. The father and mother pairs had a 4-hour education session on breastfeeding and complementary feeding antenatal in this study with the expectation of improved infant feeding practices. Similarly, a study showed infant feeding practices were successfully improved after exposure of 'fathers-to-be' to a 2-hour session on infant feeding [23]. Another study recommended the infant feeding education sessions engaging the fathers should occur antenatal and in the early postnatal period [24].

Introduction of solid and semi-solid foods was timely by a majority of those in the intervention group in this study. This could be a pointer on the positive effect of the intervention. This study did indicate a connection between the start of solid and semi-solid foods and the study group. Mothers reported various types of father support received in this study. Ensuring food was available was reported as a major father support in both groups. Similar to another study done in Kenya which identified the perceived key roles that can be played by fathers in infant feeding as the provision of food [14]. Fathers' support in the form of household chores was reported in our study as important. This is consistent with the findings of another study done in Australia which identified perceptions of what constitutes father support and helping with house chores was recognized as one form of support [24].

This study reported the fathers in the intervention group as participating more in decisions on time to introduce complementary foods, the frequency of meals and food diversity which differs from fathers in the control group. These findings are in agreement with those of a study done in Ethiopia which aimed to increase male participation in infant feeding [25] and another study done in Kenya that assessed maternal perception of male participation in infant and young child feeding [14], which showed that men generally are less involved in decision-making for infant feeding. Thus, the positive outcome of the intervention group could be attributable to the nutrition education received by the fathers in the control group maybe still holding on to the cultural norms.

In this study, the minimum acceptable diet attainment was high among the intervention group and in the same group, most of the mothers had reported receiving father support in the form of motivation and information. This could be an indication that the intervention may have had an effect on the infant feeding practice. The findings of positive emotional support by our study are similar to another study that described the major role of the father as that of supporting infant feeding by using their knowledge to encourage and support mothers in infant feeding [26]. Another study also showed that mothers who had partners verbally encouraging them on breastfeeding had a higher success rate [27].

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CONCLUSION

Nutrition education targeting the father contributed positively to complementary feeding practices. Father support was found to be more in the decision making around timeliness of introduction of solid and semi-solid foods, the frequency of meals, and food diversity, as well as, the sharing of information and giving motivation on following the recommended infant feeding practice in the intervention group. Fathers can be reached with information on complementary feeding through the health facilities which may contribute to improved infant feeding practices.

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Table 1: Comparison of demographic, socio-economic and knowledge traits for the study groups at baseline (N=290)

Variable		Control group (N=145)	Intervention group (N=145)	Chi-square x^2	p
Education					
	Father			6.58	0.307
	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			0.38	0.18
	Primary level	37.2 (54)	53.8 (78)		
	Secondary level	53.1 (77)	40 (58)		
	College level	9.7 (14)	6.2 (9)		
Occupation	Father			3.57	0.114
	Self-employment	31.8 (46)	33.7 (49)		
	Formal employment	20 (29)	25.5 (37)		
	Casual employment	48.3 (70)	40.7 (59)		
	Mother			5.82	0.671
	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				7.48	0.196
	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)		
Maternal knowledge about breastfeeding					
	Breast milk first feed	142 (97.9)	137 (94.5)	9.37	0.103
	Start breastfeeding within 1hr	86 (59.3)	92 (63.4)	2.57	0.168
	Breastfeed for 2 years	83 (57.2)	89 (61.4)	3.28	0.550
	Exclusive breastfeeding for six months	63 (43.4)	58 (40)	1.17	0.055

Note EBF-Exclusive breastfeeding

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Table 1: Dietary diversity score at 9 months of age

Dietary diversity score	Intervention group % (n) (N=137)	Control group % (n) (N=141)	Chi-square x^2	P
Infants 9 months of age			2.11	0.10
< 4 food groups	16.8 (23)	18.4 (26)		
≥ 4 food groups	83.2 (114)	81.6 (115)		

Table 2: Food variety intake at 9 months of age

Characteristics	Intervention group %(n) (N=137)	Control group % (n) (N=141)	Chi-square x^2	p
Infants 9 months of age				
Grains, roots and tubers	97.5 (117)	95.4 (125)	0.78	0.50
Legumes and nuts	84.2 (101)	76.3 (100)	0.10	0.15
Dairy products	97.5 (117)	95.4 (125)	0.79	0.50
Flesh meat	91.7 (110)	90.8 (119)	0.41	0.83
Eggs	77.5 (93)	60.3 (79)	25.74	0.01**
Vitamin A rich fruits and vegetables	96.7 (116)	95.4 (125)	0.55	0.75
Other fruits and vegetables	96.7 (116)	95.4 (125)	0.55	0.75

***** p = < .05 indicates significant trend***

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Table 4: Fathers support with complementary feeding

Variable	Intervention group % (n) (N=137)	Control group % (n) (N=141)	Chi-square x^2	P
Decision making on complementary feeding				
The final decision on time to start complementary feeding	70.1 (96)	23.5 (33)	31.6	0.02*
The frequency of feeding child	80.4 (110)	19.7 (28)	38.7	0.01*
Variety of foods given	78.2 (107)	18.7 (26)	39.1	0.00*
Other forms of support				
Participate in child feeding	51.6 (71)	47.1 (67)	2.05	0.11
Assist in household chores	73.7 (101)	66.3 (94)	1.27	0.32
Provide appropriate information about complementary feeding.	79.6 (109)	11.8 (17)	37.6	0.01*
Buying food for the child	93.6 (128)	88.6 (125)	0.90	0.63

Note * p = < .05 indicates significant trend

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Table 5: Multiple linear regression analysis of father support associated with minimum acceptable diet

Variable	B	SE	*t*	*p*
The final decision on time to start complementary feeding	7.04	0.73	9.62	0.02*
The decision on the frequency of feeding the infant	0.63	0.20	-9.51	0.01*
The decision on the variety of foods given to the infant	6.18	0.26	-0.24	0.03*
Provision of appropriate information on complementary feeding	0.01	0.01	9.64	0.00*
R^2	0.73			
Adjusted R2	0.72			
F value	35.03			
F significance	0.01			

Note * P<0.05 significant

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