DURATION OF EXCLUSIVE BREASTFEEDING AND SUBSEQUENT CHILD FEEDING ADEQUACY

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SUMMARY

Objective: Mothers of young children in Ghana believe that breastfeeding exclusively for six months impairs subsequent introduction of other foods. The current study was designed to determine whether feeding adequacy among 9-23 months old children is influenced by duration of exclusive breastfeeding.
Design: We surveyed 300 mother-infant pairs attending child-welfare-clinic at the University of Ghana Hospital, Accra. Data collected included socio-demographic characteristics, morbidity, breastfeeding history, and maternal practices and perception on child feeding and temperament. Current child feeding was assessed using 24-hour dietary recall. Adequately fed children were defined as 9-23 month old children meeting three basic feeding adequacy thresholds: 1) was fed complementary foods, at least three times in the last 24 hours, 2) was fed from at least three food groups, and 3) received breast milk in the last 24 hours. Multiple logistic regressions were used to identify independent predictors of child feeding adequacy.
Results: About 66% of children were exclusively breastfed for six months and only 56% were adequately fed in the in the 24 hours preceding the survey. Child feeding adequacy was unrelated to duration of exclusive breastfeeding (OR=0.73; p=0.30). After controlling for child sex, age, and maternal education, the independent determinants of feeding adequacy included recent child morbidity (OR=0.41; p=0.03), number of caregivers who feed child (OR=1.33; p=0.03), and maternal perception that child does not like food (OR=0.25; p<0.01).
Child temperament was unrelated to feeding adequacy.
Conclusion: Child feeding adequacy is not affected by duration of exclusive breastfeeding. The study provides evidence to address misperceptions about exclusively breastfeeding for six months.

Key words: Exclusive breastfeeding, child, dietary diversity, feeding adequacy, duration

INTRODUCTION

Suboptimal child feeding practices have been identified as a key determinant of childhood malnutrition and wellbeing. In 2003, the Lancet series on child survival identified promotion of appropriate breastfeeding (exclusive breastfeeding for six months followed by breastfeeding plus adequate complementary feeding) as the single most effective preventive public health intervention for reducing mortality among children aged under 5 years.[1]

More recently in 2008, the Lancet series on maternal and child malnutrition reported that suboptimal breastfeeding accounts for 12% of under-five mortality and as much as 10% of the global burden of morbidity in children.[2] Nevertheless, suboptimal feeding remains prevalent, especially in developing countries, with both short and long term impacts on the wellbeing of children.[3]

In Ghana, breastfeeding of infants is a common practice. Typically, children are breastfed for a long duration (median of 20 months).[4] Indeed, the rate of exclusive breastfeeding (EBF) for 6 months has improved remarkably in Ghana from less than 5% in 1989 to about 63% in 2008.[5] However, EBF usually lasts for a median of just about three months, indicating that the proportion of EBF children declines rapidly during the first six months of life. The 2008 demographic and health survey reports that while among infants under two months, 84% were being exclusively breastfed, by age 4-5 months, only 49% were still being exclusively breastfed.[4]

The capacity to improve EBF may be challenged by maternal misperceptions. Studies in various settings have reported reasons given by care-givers for not practicing EBF and these include caregiver's belief that the child is thirsty, pressure from family and friends, and perceived insufficiency of breast milk alone.[6,7]

Additionally, some mothers have expressed fears that EBF will lead to a child experiencing difficulty in transitioning from breast milk alone to other foods, thus making their feeding difficult.[8,9] A more recent study in the Manya Krobo district of Ghana found that some mothers believed that exclusively breastfed children refuse all other foods at 6 months and only begin to eat when breastfeeding is completely stopped.[10]

The aim of the current study, therefore, was to determine the influence of EBF on the adequacy of child feeding between ages 9 and 23 months. Based on the existing evidence, we hypothesised that the fear expressed by mothers concerning EBF was not real and that EBF should not adversely affect adequacy of subsequent child feeding. Being confident that we will find evidence to support our hypothesis, we wanted to go further to identify the key determinants of child feeding adequacy for the 9 to 23 month age group. Such evidence would be useful in breastfeeding promotion by averting the spread of misperceptions, and helping mothers make informed choices on child feeding.

METHODS

The current study was carried out between June and July 2010, at the University of Ghana Hospital in Accra. The University Hospital serves faculty, staff and students of the University as well as residents in communities living on the university campus and in communities in proximity to the University. A cross-sectional study design was utilized in data collection. Eligible survey participants were mothers of healthy children between ages 9 and 23 months who were accessing preventive health services at the child welfare clinic (CWC) of the Hospital. The CWC is held once each week at the Hospital. All eligible mothers attending the CWC during the study period were invited to participate in the study. An informed consent form was administered to eligible mothers.

Study participants completed a semi-structured questionnaire designed for the study. The questionnaire collected data on participant socio-demographic characteristics, child morbidity, and child feeding. Household ownership of key household items was used to calculate a wealth score of study participants. Study participants were asked about household ownership and their responses were used to calculate a wealth score for each household.[5] Questions were asked about the ownership of a car, telephone, pipe-borne water, radio, block house, refrigerator, television/computer, electricity and gas/electric cooker.

The 24-hour dietary recall method was used to record all foods consumed by the index child in the 24 hours preceding the interview. In addition, participant's perception of the child's feeding behaviour was assessed using questions including: 'Would you say your child ate well during the last one month?' and 'How many days in the last one week has the child eaten less than usual when food was offered?'. Early feeding behaviour was assessed by asking mothers to recall the earliest age at which the index child was first given water or any solid or liquid foods. Furthermore, child temperament and maternal knowledge and perceptions of appropriate child feeding were measured. The questionnaires were administered by trained interviewers.

Data were analysed using SPSS version 16 (SPSS Inc, Chicago, USA). EBF duration was derived using the 'exclusive breastfeeding since birth' approach.[11] Wealth index was computed by reported in the demographic and health surveys.[5] All children who were reported to not have received water or any foods/fluids until they reached six months were classified as exclusively breastfed for six months.

Adequately fed children were defined as 9-23 month old children meeting three basic feeding adequacy thresholds:
1) Was fed complementary foods, at least three times in the last 24 hours,
2) Was fed from at least three food groups, and
3) Received breast milk in the last 24 hours.

The food groups considered in the above definition included:
1. Animal source foods
2. Beans and nuts
3. Fats and oils
4. Milk and milk products
5. Tubers
6. Cereals, and grain-based foods
7. Fruits and vegetables.[12]

Bivariate analysis examined the relationship between adequate feeding and maternal and child characteristics including morbidity, EBF duration and maternal knowledge and perceptions. Logistic regression was used to identify independent predictors of adequate feeding. Ethical clearance for this study was obtained from the Ministry of Health Ethical Review board.

RESULTS

The analysis of the survey data included 300 mothers of children ages 9-23. The mean age of the women was 28.7 ± 4.7 years (range: 18-45).

The mothers lived in households with an average household size of 4.8 ± 1.7. Table 1 details the socio-demographic characteristics of study participants. Additionally, a majority (97.3%) of the mothers had accessed antenatal care services for at least four times during their last pregnancy, as recommended by the Ghana Health Service.[13]

Table 1 Background characteristics of study participants and their children

Characteristics	Frequency	%
Household Size		
2-3	65	21.7
4-6	197	65.6
7+	38	12.7
Number of Children under 5 years		
One	188	63.1
Two or more	110	36.9
Maternal age group (y)		
18-24	57	19.2
25-29	124	41.8
30-34	75	25.2
35+	41	13.8
Education completed		
None	15	5.0
Primary	36	12
*JHS/Middle School**	101	33.7
Senior secondary	112	37.3
Post secondary	36	12
Current living situation		
Living with partner	283	96.3
Not living with partner	11	3.7
Currently working		
Yes	146	48.7
No	154	51.3
Antenatal attendance during last pregnancy		
Three times or less	11	3.6
At least four times	289	96.4
Child sex		
Male	152	51.7
Female	142	48.3
**JSS: Junior High School*		

Table 2 displays the feeding behavior of the children included in the study. The findings demonstrate that although all children were introduced to breastfeeding, only 66% were exclusively breastfed during the first six months. In addition, only about 56% were being fed adequately based on accepted recommendations.

Table 3 shows relationships between adequacy of feeding and maternal and child characteristics which explain the feeding outcomes. In bivariate logistic regression analysis, no significant difference was observed in adequacy of child feeding among children who were EBF for at least five months compared to those who were EBF for a shorter duration (OR=0.9; p =0.72). Child feeding adequacy was, however, associated with other factors. There was a significant positive association between the number of other persons (other than the mother) who were involved in feeding a child and feeding adequacy.

The more the number of additional persons who fed a child, the better the feeding adequacy (OR=1.3; p=0.04). Also, mothers reporting that a child does not like food was associated with less likelihood of being fed adequately (OR=0.24; p<0.001).

Table 2 Feeding Behaviour of 9-23 month old Ghanaian children, Accra

Feeding behaviour	Frequency	%
Fed adequately [¥]		
Yes	173	55.7
No	127	42.3
Currently breastfeeding		
Yes	268	89.3
No	32	10.7
Exclusive breastfeeding duration (months)		
1-2	31	10.4
3-4	31	10.3
5-6	238	78.3
Fed at least 3 times in last 24 hours		
Yes	204	68.0
No	96	32.0
Given food from at least 3 food groups in last 24 hours		
Yes	230	76.7
No	70	23.3
Not been eating well during last month		
Yes	63	21.5
No	230	78.5
Days of last week child has eaten less than usual		
None	192	64.0
1-3	56	18.7
4+	52	17.3
Days in last week that mother has been anxious that child has not eaten well		
None	199	66.6
1-3	38	9.4
4 +	52	17.4

[¥] In the last 24 hours, child received breast milk, given food from at least three food groups, and fed at least three times.

Table 3: Independent predictors of child feeding adequacy identified by logistic regression

Predictors	Odds Ratios			
	Unadjusted	p-value	Adjusted	p-value
Exclusive breastfeeding duration				
4 months or less (reference)	1.00		1.00	
5-6 months	0.90	0.72	0.73	0.30
household wealth index				
First (reference)	1.00		1.00	
Second	2.29	<0.01	1.47	0.27
Third	2.89	<0.01	1.62	0.29
Mothers education				
None/primary	1.00		1.00	
JHS/Middle	1.40	0.33	1.16	0.71
Secondary+	2.25	0.01	1.77	0.16
Child Sex				
Female (reference)	1.00		1.00	
Male	1.03	0.89	0.86	0.56
Child Age (months)	1.06	0.12	1.03	0.48
Number of Persons who feed child	1.26	0.04	1.33	0.03
Attended to by a health worker				
No (reference)	1.00		1.00	
Yes	0.48	0.04	0.41	0.03
Mother reports child does not like food				
No	1.00	<0.01	1.00	<0.01
Yes	0.24		0.25	

Adequate child feeding was also associated with some maternal and child characteristics. Adequacy of child feeding was better among children whose mothers had at least secondary level education (OR=2.25; p=0.014) compared to those with primary or no education. Additionally, household highest wealth score was significantly associated with child feeding adequacy (OR=1.03; p=0.016).

Table 3 shows other factors that were associated with child feeding adequacy in bivariate logistic analysis. Maternal perceptions of child's disposition (measured as tendency to crying, degree of sociability, degree of fussiness, and capacity to adjust to changes), did not predict feeding adequacy.

In multiple logistic regressions with child feeding adequacy as the outcome, EBF was not a significant predictor (Table 3). Rather, the factors that remained in the model as independent predictors of child feeding adequacy were the child's attitude to food, a recent morbidity and the number of persons, besides the mother, who usually feed the child. Feeding adequacy was significantly less likely among children who were reported by the mother to not like food (OR=0.25; p<0.001) as well as those who whose recent morbidity in the last month necessitated the attention of a health worker (OR=0.41; p=0.028).

DISCUSSION

The current study was designed to answer two main questions: firstly, does EBF (up to 6 months) negatively affect child feeding thereafter?', and then, 'what are the independent determinants of adequate child feeding beyond the 6th month?' Our hypothesis concerning the first question was that EBF does not negatively influence child's acceptance of complementary foods. This hypothesis was in agreement with the existing literature[9] which suggested no effect of EBF on child's appetite and food acceptance.

This hypothesis was confirmed by the findings of the current study which showed that among children 9-23 months old, there was a difference in the adequacy of feeding among those who were exclusively breastfed for a longer duration (5-6 months) in comparison to those exclusively breastfed for a shorter duration (4 months or less). The implication of this finding is that mothers do not need to worry that their children will not be able to feed well if they adhered to the current WHO and the Ghana Health Services recommendations that children should be exclusive breastfed during the first 6 months of life with continued breastfeeding for up to two years of age and beyond.[14-16] These findings may also be extended for use in countries with similar child feeding practices as occurs on Ghana.

Our findings therefore support the current recommendations to promote EBF for six months.[15] Together, these findings can therefore be used as part of the tool kit employed by breastfeeding promoters, pediatricians, family planning providers, and other health care providers for breastfeeding promotion in the local Ghanaian context and beyond. The opportunities for interaction between health workers and caregivers should be used to address the misconception that EBF for six months will affect subsequent feeding behaviour of children.

The multivariate logistic regression model developed to address the second research question, demonstrated that adequate feeding was independently predicted by three main factors: the child's health status, the feeding situation, and the mother's perception of the child's attitude to food. Childhood illness is a known factor that limits adequate feeding as it elicits anorexia[17] and thus reduces child food acceptance.[18] The role of the feeding situation in predicting feeding adequacy was indicated by a significant improvement in feeding adequacy as the number of people who feed the child increases.

A number of reasons may explain this finding. Firstly, some studies have reported that infants who are exposed to a greater range of tastes during the initiation of complementary feeding are more likely to consume foods which parents report as 'difficult to feed' to children, i.e. fruits and vegetables in childhood.[19, 20] It is likely therefore that as more persons are involved in feeding the child, they are more likely to provide the child with varied feeding exposures. Secondly, because child temperament affects child feeding[21, 22] having a wider range of potential feeders may be useful if the mother may not necessarily be the most adept at adapting to the temperament of the child.

Between the sixth and ninth months postpartum, 11% of children had continued to receive breast milk alone as their only source of nourishment. This finding was not unexpected since it is an outcome which is commonly reported in community surveys. The DHS in 2008 reported that 5.3% of children 6-9 months were exclusively breastfeeding.[4]

In the current study, about 22% of mothers perceived that their child did not like food. This is also not an uncommon behavior because children have been reported to go through a period of food fussiness or food refusal at some time.[23] There is concern, however, when this behaviour does not resolve over an acceptable period and leads to malnutrition.[21] The finding that maternal perception of child's feeding attitude was related to their feeding adequacy may be explained by effect of the mother's perception on her feeding behaviour. Sanders and colleagues,[24] have reported that parents of children who are difficult to feed are more likely to verbalize negative comments and engage in negative and coercive feeding practices.

In the current study, feeding behaviour mirrored those observed in the most recent demographic and health survey.[4] The rate of EBF was similar to the DHS estimate of 63%. Also in the DHS, 69% of children had been fed from at least 3 food groups in the last 24 hours. However, the DHS reported only about 36% of children who are fed adequately compared to 57% in the current study. The huge difference in the estimates of feeding adequacy could be explained by the inclusion of non-breastfed children in the DHS estimate. The DHS shows that non-breastfed children were twice less likely to be adequately fed.

Altogether, these findings suggest that feeding adequacy among these 9-23 month olds were independently predicted by caregiver attitudes and perceptions towards the feeding experience as well as child health status. Interventions to address poor child feeding should thus seek to understand the caregiver-child interactions, their individual dispositions as well as health status of the child, as may be practicable in the context.

While the current study provides important findings regarding the influence of exclusive breastfeeding on subsequent complementary feeding adequacy in children, the cross-sectional design used has limitations, important among which is the difficulty in recall of breastfeeding behavior which could affect the outcomes of the study. A cross-sectional study also is ranked less in identifying/describing risk factors compared to a longitudinal design which has the advantage of observing the exposure prior to the outcome.

CONCLUSION

This current study's results do not confirm the often held belief that EBF up to six months will interfere with the child's acceptance of complementary foods. The results of the current study do not support this fear which has been expressed by mothers in Ghana and elsewhere. Rather, our findings identified caregiver perceptions and practices as well as child health as independent predictors of child feeding adequacy. These findings may be used in Ghana and similar settings to dispel misperceptions and promote EBF practice for the recommended duration of six months.

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