Role of Regular ANC Visits and Feeding Practices in Preventing Malnutrition in Children Under Five Years Old

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Abstract: *Introduction*: Malnutrition has a significant impact on global disease for the majority of children worldwide, by being responsible for almost half of the deaths of children under the age of five especially in the developing countries including Eritrea. However, there is no clear information on the role of antenatal care and feeding practices in preventing malnutrition. Therefore, assessing the role of antenatal care visit and feeding practices in preventing malnutrition is of vital importance.

Objective: To assess the role of regular ANC visit and feeding practices in preventing malnutrition among children aged 0-59 months, who visited Orotta National Pediatric Referral Hospital from 31st August – 30th September, 2016.

Methodology: A cross-sectional, Hospital based study was carried out. Data were collected from mothers (caretakers) using semi-structured questionnaire developed for the purpose. Moreover, anthropometric measurement of the subjects was taken. Data was and entered to the computer and analyzed using SPSS version 20 and p-value <0.05 at 95%CI was considered as statistically significant.

Results: The main associated factors of stunting were found to be the frequency of breastfeeding and antenatal care visit. Underweight was associated with weaning of breastfeeding. Frequency of breastfeeding and weaning of breastfeeding were the only variables associated with wasting.

Conclusion and Recommendation: Malnutrition remains a major health problem among children aged 0-59 months. Hence, interventions regarding regular antenatal care visits and feeding practices are highly suggested to be given special attention.

Keywords: Antenatal care, Breast Feeding, Stunting, Underweight, Wasting, Children, under five years.

INTRODUCTION

Malnutrition bears a significant burden accounting for almost one-fifth of global disease and is responsible for about 45% of deaths in children under five [1,2]. In 2005 alone, stunting, severe wasting, and intrauterine growth restriction together were estimated to be accountable for 2.2 million deaths and 21% of loss of disability-adjusted life-years in children under five years old [2]. The percentage of underweight and stunted children worldwide has declined since the 1990s [3]. Nevertheless, 99 million children under five years old were estimated to be underweight in 2013.

On the contrary, the number of stunting in Africa increased from 46 million in 1990 to 59 million in 2013. Stunting results from prolonged periods of malnutrition and exposure to infectious diseases, and it's evidenced that more than 70% of stunting takes place before a child's second birthday [4]. It is a universal consensus that children all over the world have the same growth potential in early childhood, providing the right conditions, like adequate feeding and low exposure to infectious diseases [5]. Growth insufficiencies are, therefore, a strong markers of all standards of living and well-being. These early life deficits, in turn, can lead to deficiencies in later life outcomes, which eternalizes a cycle of under-achievement and low standards of living. For example, stunting in early childhood has been linked to altered cognitive progression, impaired school performance, lower economic productivity in adulthood and poorer maternal reproductive outcomes [6]. Hence, the effects of malnutrition place a significant burden on the global and regional economy and contribute to so-called 'poverty traps' [7,8]. As depicted by UNICEF, the causes of malnutrition fall under two main categories, namely, immediate and underlying causes where the underlying causes include factors leading to inadequate dietary intake and infectious disease including inadequate household access to food, poor health services, unhealthy environments, and insufficient care of children and women [9]. Report from WHO noted that good antenatal care connects the woman and her family with the formal health system increases the likelihood of using a skilled attendant at birth further contributing to better health through the life cycle [10]. And as per the WHO recommendation in 2002, the approach to ANC was categorized into a goal-orientated or focused way to improve quality of

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care and increase its coverage, particularly in low and middle-income countries. The focused ANC model comprises four visits during pregnancy taking place between 8 and 12, 24 and 26, at 32 weeks, and between 36 and 38 weeks of gestation. Globally, during the period 2007–2014, only 64% of pregnant women attended the WHO-recommended minimum of four contacts for ANC, suggesting that much more work needs to be done to address ANC utilization and quality, but in low- and middle-income countries, ANC utilization has increased since the new 2002 WHO ANC model [11]. Eritrea, being one of the developing countries, the ANC coverage has increased from 71% in 2002 to 88% in 2010 [12].

Furthermore, the WHO recommends that infants be exclusively breastfed for the first six months, followed by breastfeeding, along with complementary foods for up to two years of age or more [13]. Exclusive breastfeeding is defined as the practice of only giving an infant breast-milk for the first six months of life (no other food or water) [14] day and night 8-12 times per 24 hours and more frequently if needed, especially in the early weeks [15], where the initiation begins within one hour of life and continued up to 2 years of age or beyond since it is an irreplaceable nutrition for a child's growth and development. Hence, it serves as a protection from respiratory infections, diarrheal disease, and other potentially life-threatening conditions by acting as the child's first immunization [16]. Worldwide, only 38% of infants 0 to 6 months old are exclusively breastfed [17,18]. Recent studies show that inadequate breastfeeding practices (non-exclusive breastfeeding) contribute to 11.6% of mortality in children under 5 years of age, which was proportional to about 804 000 child deaths in 2011 [17]. In Eritrea, breastfeeding is nearly universal, with almost 100% of mothers initiating breastfeeding and more than two-thirds of children aged less than six months are exclusively breastfed. In contrary, complementary feeding is not started for 50% of children aged 6-9 months [12].

Generally, malnutrition under five was one of the greatest public health problems in developing countries particularly in Sub-Saharan Africa and about 35% of under-five deaths in the world were associated with malnutrition, and in Eritrea it was about 13% [12,19]. Moreover, as per the report of EPHS, the proportion of wasting was stable despite the increase in underweight, stunting and overall chronic malnutrition in the last eight years [12]. Being stated as such, so far there are no relevant studies focusing on the real and actual role of regular ANC visits and feeding practices in preventing the occurrence of malnutrition. Therefore, the ultimate objective of this study is to analyze the impact of regular ANC visit and feeding practices in preventing malnutrition among children aged 0-59 months in ONPRH who attended during the study period.

METHODOLOGY

Research Design

The study was a hospital based cross-sectional study conducted at Orotta National Pediatric Referral Hospital from 31st August – 30th September of 2016.

Study Area and Period

The study was conducted from 31st August – 30th September of 2016 in Orotta National Pediatric Referral Hospital, which is located in Asmara capital city of Eritrea. Specifically in the Out-Patient Department, Emergency ward, ward B, and C, which gives services for about 60-80 patients per day who are less than 14 years of age visiting from different corners of the country.

Study Population

All children aged from 0-59 month who visited the study area within the specified period of time were eligible for the study. Besides, children whose Weight for height (<80% reference or SD score <-2), Height for age (<90% reference or SD score <-1), Weight for age (<80% reference or SD score <-2) were enrolled in the study.

Data Collection Tools and Analysis Method

A standardized questionnaire was developed by performing a pilot study prior to data collection, and then data was collected by interviewing the mothers of interest/care givers. Both Medical history of the Mothers and the Child and anthropometry measurements were also obtained by measuring weight for height, height for age, and weight for age from the subjects. Then data were cleaned, edited and fed to the computer and analyzed using SPSS version 20. To assess the associations the variables were subjected to logistic regression model and results were presented with p-value at 95% CI. Associations with a p-value less than 0.05 were considered as statistically significant.

Ethical Consideration

Ethical clearance was obtained from the Health Research Ethics and Protocol Review Committee of the Ministry of Health and Medical Director of ONPRH. Besides, all ethical and professional considerations were taken to keep study participants confidentiality. Both Verbal and written consent was taken from Mothers and caregivers before enrollment.

RESULT

Child Biographic Information

A total of N=125, children were recruited during the study period from August 31st – 30th September, 2016. Of these, 52 (41.6%) were females, and 73 (58.4%) were males. The ages of the children recruited in the study ranged from 0 to 59 months; the mean age was (19.4) months. The mean age for females (19.77), and that of the males (19.02). Majority of the children 88 (70.4%) were born in a health facility, whereas the remaining 37 (29.6%) were born at home. Regarding gestational age at birth, 115(92%) were born at nine-month, and 10 (8%) were born at less than nine-month of gestational age. Concerning birth weight, majority of the children 53 (42.4%) were born with birth weight between 2.5-3kg, the remaining 40 (32%) and 32 (25.6%) were born with birth weight <2.5kg and > 3kg respectively Table **1**.

ANC Visit and Nutritional Status during Pregnancy and Lactation

From the total participants N=125, 67(53.6%) of the Mothers were from rural, and 58(46.4%) were from urban areas. Most of the mothers and/or caregivers were in the age group of 20-35, 85 (68%) and >35 age group 34 (27.2%). Only 6(4.8%) mothers were under the age of 20 years. 76 (60.8%) had visited the antenatal care facility more than four times during their pregnancy, 38 (30.4%) visited three times, and nine (7.2%) visited one to two times, and two (1.6%) did not visit at all. From mothers of N= 125 subjects, 109 (87.2%) included the six essential nutrients “sometimes” in their diet, six (4.8%) always and 10 (8%) never included them in their diet as it can be shown in Table **2**.

Breast Feeding Pattern Information of the Child

Majority of the children 79 (63.2%) were still breastfed, 46 (36.8%) have weaned breastfeeding. And

Table 1: Distribution of Malnourished Children under 5 Years by Demographic Variables in Orotta National Referral Pediatric Hospital, 31st August – 30th September, 2016. (N=125)

Characteristics	Frequency	Percentage (%)
Child sex		
male	73	58.4
female	52	41.6
Child age in month		
<6 months	12	9.6
6-12 months	18	14.4
12-36 months	88	70.4
36-59 months	7	5.6
Place of delivery		
Home	37	29.6
health facility	88	70.4
Gestational age at birth		
<9 month	10	8
at 9 month	115	92
Birth weight in kg		
<2.5 kg	40	32
2.5-3 kg	53	42.4
>3 kg	32	25.6

Table 2: Distribution of Respondents of Malnourished Children under 5 Years by Demographic Characteristics, ANC Visit and Nutritional Status during Pregnancy and Lactation in Orotta National Referral Pediatric Hospital, 31st August – 30th September, 2016. (N=125)

Characteristics	Frequency	Percentage (%)
Age of Mothers/Caregivers		
<20 years old	6	4.8
20-35 years old	85	68
>35 years old	34	27.2
Residence		
Rural	67	53.6
Urban	58	46.4
Number of Antenatal Care Visit		
0	2	1.6
1-2	9	7.2
3	38	30.4
≥ 4	76	60.8
Do you include all the six essential nutrients in your diet?		
always	6	4.8
sometimes	109	87.2
never	10	8

out of those who weaned, five (10.87%) and 41 (89.13%) weaned less than 24 months and greater than 24 months respectively. From the total 125 children who participated in the study, 87 (69.6%) initiated breastfeed immediately after they were born, 30 (24%) and eight (6.4%) initiated breastfeed after 1-24 hours and after a day respectively. About 105 (84%) were exclusively breastfed up to six months, 9(7.2%) up to 7-12 month, six (4.8%) up to three to five months and five (4%) were exclusively breastfed up to one to three months. A total of 117 (93.6) subjects started complementary feeding at greater or equal to six months, and the remaining three (2.4%) at three to five months and five (4%) did not start complementary feeding. Regarding the frequency of breastfeeding most of the children 89 (71.2%) and 36 (28.8%) were having a frequency of less than eight and greater or equal to eight times per day, respectively. Concerning the method of feeding, mothers who used the hand as a method of feeding were 74 (59.2%), spoon 33 (26.4%), cup 12 (9.6%), bottle six (4.8%). All of the children N=125 (100%) were fully immunized for their age and supplemented with vitamin A see Table **3**.

DISCUSSION

This study has been dealing with the role of regular ANC visit and feeding practices in preventing malnutrition by incorporating growth indicators such as height for age, weight for age, and weight for height. A significant association was found on the factors such as ANC utilization, weaning of breastfeeding and frequency of breastfeeding.

Associated Factors to Stunting, Underweight and Wasting

Based on the analysis of the study, antenatal care visit and frequency of breastfeeding were found to have an association with stunting. Mothers who visited the clinic during pregnancy less than four times had a significant association with stunting with a p-value of 0.019 at 95 CI. Similarly, studies done in various nations justified the association of ANC utilization with malnutrition [20,21,22,26]. Children who were breastfed less than 8 times per day were found to have a highly significant association with stunting having a p-value of 0.000 at 95% CI. However, no relevant studies were justifying the association of frequency of breastfeeding and malnutrition.

Inadequate or delayed weaning was found to be a risk factor of malnutrition in studies done in Ethiopia, Pakistan and India, where 25%, 55.6%, and 53% of the subjects had delayed weaning [23,24,25]. The result of this study also revealed that weaning of breast feeding

Table 3: Distribution of Malnourished Children under 5 Years by Breastfeeding Pattern in Orotta National Referral Pediatric Hospital, 31st August – 30th September, 2016. (N=125)

Characteristics	Frequency	Percentage (%)
Is the child breastfeed?		
yes	79	63.2
No (weaned)	46	36.8
When did the child wean?		
Less than 24 months	5	10.87
Greater than 24 months	41	89.13
When was initiation of breastfeeding After Birth?		
immediately	87	69.6
after 1-24 hour	30	24
after a day	8	6.4
When did the child start complementary feeding?		
3-5 month	3	2.4
≥ 6 month	117	93.6
not started	5	4
Frequency of breastfeeding per day.		
< 8 per day	89	71.2
≥ 8 per day	36	28.8
Method of feeding		
bottle	6	4.8
cup	12	9.6
spoon	33	26.4
hand	74	59.2
Exclusive breastfeeding in months		
<3 months	5	4
3-5 months	6	4.8
6 months	105	84
7-12 months	9	7.2
Immunization Status for their Age and Supplementation of Vitamin -A		
Immunized and supplemented	125	100
Non Immunized and non-supplemented	0	0

Table 4: Summary of the Analysis that Test the Association of Selected Variables of Interest with Malnutrition

Selected variables		Statistical significance with p-value <0.05 at 95% CI				
	95%CI	Stunting	95%CI	Wasting	95%CI	Underweight
Frequency of breastfeeding	-	0.000	-	0.000	-	-
Weaning at > than 24 month	-	-	-	0.042	-	0.012
ANC visit	-	0.019	-	-	-	-

to be associated with under nutrition. Children who weaned at greater than 24 months had a significant association with a p-value of 0.012 at 95% CI.

After the Chi-square analysis, wasting tends to have a positive association with both the frequency of breastfeeding and weaning of breastfeeding. Children who weaned breastfeeding at greater than 24 months had a significant association with a p-value of 0.042 at 95% CI. Other studies conducted elsewhere signify that weaning greater than 24 months was a risk factor of malnutrition [23,24,25]. Unlike other studies, result from the analysis showed that children who were breastfed less than 8 times per day had a highly significant association with a p-value of 0.000 at 95% CI.

Unlike other studies, mothers' nutritional status, late initiation of breastfeeding, exclusive breastfeeding, initiation of breastfeeding, bottle feeding and other methods of feeding had no association with malnutrition.

CONCLUSION

Malnutrition continues to be a major public health problem in developing countries, and it is the most important risk factor for the burden of diseases. Based on the findings of this study, special attention should be invested on antenatal care visits and feeding practices by the ministry of health of Eritrea in general, and the nutrition unit, in particular, to sensitize and educate the community on the utilization of ANCs to reach at its maximum need and in feeding practices for their children.

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CONFLICT OF INTEREST

Authors declare that they have no conflict of interest.

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