

Poor Feeding Practices during Childhood Illnesses in Rural Pastoralist Communities of Afar, North Eastern Ethiopia: A cross sectional study

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Abstract

Background: Nutritionally adequate and safe food that meet the criteria of dietary diversity and feeding frequency during childhood illnesses would reduce susceptibility to common childhood illnesses and help develop better resistance. However, poor feeding practices that do not meet the additional nutrient requirements during common childhood illnesses are still prevalent in the pastoralist communities of Afar, North East Ethiopia.

Objective: The aim of this study was to assess the factors associated with parental feeding practices during common childhood illnesses in rural pastoralist communities of Afar, North Eastern Ethiopia.

Methods: Cross sectional study was conducted in Zone one of Afar Region, North East Ethiopia from June to July, 2016. In Zone one there are eight Woredas and 36 Kebeles/villages. A total of 600 women who have under five years children were screened for childhood illness. Then, 255 women with children who have diarrhea, fever or cough/pneumonia in the past two weeks prior to the study were included. A two-stage cluster sampling technique was used to select Kebeles and households based on proportion to population size. Bivariate and multivariable logistic regression analyses were used to identify factors associated with feeding practices. Data were analyzed using SPSS version 20 software and statistical significance was set at $p < 0.05$.

Results: Feeding practices during common childhood illnesses were poor. Very few proportions of the ill children were offered foods more than usual. Only 5.2% children with diarrhea, 5.8% with cough and 4.2% with fever were offered foods more than usual. Only 34.5% children with diarrhea, 35.1% with cough and 36.4% children with fever received additional fluids. The independent predictors of feeding practices during childhood illnesses were the availability of household assets (AOR 0.32, 95%CI: 0.12, 0.88), maternal knowledge about the frontline workers (AOR 0.24, 95%CI: 0.07, 0.86), ever use of vaccination cards (AOR 4.47, 95%CI: 1.78, 11.19) and information regarding danger signs of fever (AOR 7.57, 95%CI: 1.50, 38.17).

Conclusions: Infant and young children feeding practices during common childhood illnesses were far from optimal. Improving economic status at family level, provision of nutrition education during house to house, antenatal care and well baby clinic visits, and building the capacity of mothers to recognize danger signs during common childhood illnesses are important interventions.

Keywords: Childhood illnesses, Feeding practices, Factors associated, Pastoralist, Afar, Ethiopia

Introduction

Diarrhea, fever and acute respiratory infections are among the three most common childhood illnesses in Ethiopia and in developing countries. Children under the age of five in Ethiopia were reported to have 12% diarrhea diseases, 14% fever and 7% acute respiratory infections respectively and the problem is severe in Afar region [1]. Children's growth deteriorates rapidly during/after illness if foods and feeding practices do not meet the additional nutrient requirements associated with illness/convalescence. Nutrient losses due to infections decrease intestinal absorption, direct loss of nutrients in the gut, internal diversion for metabolic responses to infection and increased basal metabolic rate when fever is present [2]. Additionally, in low-income and middle-income countries, infant and young child feeding (IYCF) practices during and after common childhood illnesses is related with harmful traditional practices, low coverage and poor quality of primary health care services [3-6]. Moreover, due to restriction of foods during illness, poor awareness of caregivers' about the feeding needs of sick children, traditional beliefs and suboptimal counseling and support by health workers, many children are fed lower quantities of complementary foods and are fed less frequently when they are sick [7]. According to the Ethiopia DHS 2016, 33% of children under five age with diarrhea disease given less amount of liquids and 60% fed less food than usual [1].

Children's nutritional status can deteriorate rapidly during/after illness if the additional nutrient requirements associated with illness are not met and nutrients are diverted from growth and development towards the immune response. The dangers of death and morbidity due to the common childhood illnesses are much more pronounced in malnourished children. Based on the WHO/CHERG estimates, diarrhea contributes to 13% of child deaths in Ethiopia [8] and acute respiratory infection, particularly pneumonia, accounts for 18% of deaths [9]. Studies from resource poor countries have demonstrated that frequent infections along with poor infant feeding practices are important determinants of growth faltering and malnutrition [10-11]. Children's poor appetite induced by illness can contribute to perpetuate the vicious cycle of infection and stunting [12 -16]. Data from a population-based survey have shown that current and past malnutrition were associated with acute respiratory infection and hence decreasing malnutrition along with timely and proper treatment of ARI may improve children's health in resource limited settings such as the pastoralist communities of Afar [17-19].

Thus, implementation of the high impact nutrition interventions during childhood illnesses on a larger scale could prevent a large percentage of morbidities and deaths attributable to the common childhood illnesses in resource limited settings [4, 20]. However, owing to the precarious living conditions, poor awareness of child feeding practices, poor access to safe drinking water

and high level of food insecurity in the pastoralist communities could lead to severe outcome. Thus, this study aimed to determine the magnitude and predictors of child feeding practices in under-five children with common childhood illnesses.

2. Methods

2.1 Study Setting and Population

This survey was conducted in Zone one of the eight Woredas and 36 Kebelles/villages of Afar Region, Ethiopia. Afar Region is one of nine regional states of Ethiopia and has a total surface area of 97, 256 sq km. It extends all the way from Eritrea and Tigray in the North to Oromia Regional State in the South and is bounded on the east by the Republic of Djibouti and Amhara Regional State in the West. It is classified under the desert and semi-desert agro-ecological zones. The majority of the area in the region is low land having an altitude of 200 meters Below Sea Level (BSL) to 1500 meters Above Sea Level (ASL). The data were collected from June to July 2016.

Study population

The study populations were women who have under-five age child with childhood illness such as diarrheal disease, fever or cough.

Study Design and Sampling Technique

Community based cross-sectional survey was conducted among children under five years of age.

A sub-sample of all women (n = 255) with sick children were included from the iCCM baseline survey for Emory University. A total of 600 households were screened to get the current sample size.

Zone one of Afar region was purposively selected as it was a site for the iCCM and CBNC project of Emory University. All of the eight Woredas in the zone were included in the study. A two-stage cluster sampling technique was used to select sample clusters and households based on the estimated sample size. The primary sampling units (PSU) for the survey were Kebelles and the secondary sampling units (SSU) were households within the selected Kebelles. The total number of households with under five children from each Woreda was determined by proportion to population size (PPS) using the number of children under five as the measure of size. Taking the mobile or semi-mobile nature of the communities, the Kebelles (clusters) with large number of households were selected in consultation with the Woreda administration and/or health offices. Depending on the size of the Kebelles, all households with under-five children were selected in small size Kebelles and in large size Kebelles, households with under-five children were selected randomly through house to house visits.

Data collection

Data were collected using face to face interviewer administered questionnaire. A structured questionnaire was developed in English and translated to Amharic and field tested before the actual data collection. The pretest was done in two Kebelles from Dubti and Aysieta Woredas. Prior to the actual data collection, both data collectors and supervisors were trained for five days. In order to ensure data quality, the team had implemented a standard data quality control

procedure at each critical stage of the survey design and implementation. The data collection was made to operate within a strict supervision on a daily basis. The quality of data was further ascertained during the data entry and cleaning process.

Data analysis

Data entry template was designed using Microsoft Office Excel Worksheet. Data was coded, cleaned to check for completeness and outliers and missed values of variables. Then it was exported to SPSS version 20 software for analysis. Bivariate and multivariable logistic regression analysis was used to identify predictors of feeding practices during childhood illnesses.

Table 1: Socio-economic and demographic characteristics of the respondents, Afar Regional State, Ethiopia, 2016 (n = 255).

Characteristics		Frequency (n)	Percent (%)
Child sex	Female	116	45.5
	Male	139	54.5
Child age (n = 249)	0-11 months	26	10.4
	12-23 months	73	29.3
	24-59 months	150	60.2
Maternal religion	Muslim	253	99.2
	Christian	2	0.8
Maternal ethnicity	Afar	237	92.9
	Amhara	17	6.7
	Tigray	1	0.4
Marital status	Married	245	96.1
	Single (separated, divorced, widowed)	10	3.9
Maternal education	Unable to read and write	220	86.3
	Able to read and write	35	13.7
Family size (n = 253)	2-5	123	48.6
	6 and above	130	51.4
Time to reach health post (n =	< = 30 minutes	98	67.6
	31-60 minutes	13	9.0

Statistical significant level is set at p-value less than 0.05.

Ethical considerations

Ethical clearance was obtained from the Institutional Review Board of the College of Health Sciences, Mekelle University. In addition, informed consent was taken from mothers.

3. Results

3.1 Socio Demographic Characteristics

A total of 255 mothers whose children had an illness two weeks prior to the study participated. The majority of the mothers were Muslims (99.2%) and Afar (93%) in ethnicity. Most proportion of the mothers were unable to read and write (86.3%) (Table 1).

145)	61-180 minutes	17	11.7
	Above 3 hrs	17	11.7
Time to reach health center (n = 97)	< 30 minutes	29	29.9
	31-60 minutes	14	14.4
	61-180 minutes	29	29.9
	Above 3 hrs	25	25.8
Nearest health facility	Health post	145	56.9
	Health center	110	43.1
Livestock ownership	Yes	222	87.1
	No	33	12.9

Water and Sanitary Conditions of the Households

River, tap water and ponds/dams were the main sources of drinking water for 44%, 36% and 18% of the households respectively. More than a third (37%) of the households did walk for more than one hour to get drinking water. The majority (83%) of

mothers do nothing to treat the water and make it safer for drinking. Many households (77%) do not have any kind of toilet facility and used bushes or open fields instead (Table 2).

Table 2: Water and sanitary condition of the households in the study areas of Afar Regional State, Ethiopia, 2016 (n = 255).

Characteristics		Frequency	Percent
Source of drinking water*	Tap water	92	36.1
	Well	12	10.6
	Spring	14	5.5
	River	112	43.9
	Pond/Lake/Dam	46	18.0
	Rainwater	20	7.8
Time to get drinking water and come back (n = 254)	< = 30 minutes	117	46.1
	31-60 minutes	44	17.3
	61-180 minutes	77	30.3
	Above 3hrs	16	6.3
Household water treatment	Yes	43	16.9
	No	212	83.1
Household toilet facility (n = 253)	No facility/Bush/Field	195	77.1
	Latrine (flush, pit latrine or VIP)	58	22.9

*: Households might have more than one source of drinking water.

Occurrence of Childhood Illnesses

The occurrence of common childhood illnesses (diarrhea, cough/pneumonia and fever) was lowest during the exclusive breastfeeding period (0–5months) and highest during the late complementary feeding period (12 and above months).The proportion of caregivers who sought medical

advice was highest in the event of fever compared to the events of cough/pneumonia and diarrhea (**Table 3**). The majority of the mothers did not know all the danger signs of under five children. The danger sign frequently mentioned was fever.

Table 3: Percentage of children 0-23 months old who experience diarrhea, cough/pneumonia or fever in the two weeks preceding the survey in Afar Regional State, Ethiopia, 2016 (n = 255).

Variable	Categories	Common childhood illnesses		
		Diarrhea, n (%)	Cough/pneumonia, n (%)	Fever, n (%)
Age in months	0-5	1(0.9%)	2 (1.5%)	1(0.8%)
	6-11	12(10.6%)	11(8.1%)	11(10.2%)
	12 and above	100(88.5%)	122(90.4%)	108(90%)
Sought medical advice	No	97 (83.6%)	112(81.6%)	66(54.5%)
	Yes	19(16.4%)	26(18.8%)	55(45.5%)

Sick Child Feeding Practice of Mothers

The proportion of mothers/caregivers who fed their children with less than usual was common in the events of diarrhea, cough/pneumonia and fever. Very few proportions of the ill children were offered

with more than usual foods to eat and fluids to drink during childhood illnesses. Only 5.2, 5.8 and 4.2% of the sick children from diarrhea, cough and fever were offered with more than usual foods to eat, respectively (Table 4).

Table 4: Sick child feeding practice of mothers, Afar Regional State, Ethiopia, 2016 (n = 255).

Characteristics		Diarrhea		Cough/Pneumonia		Fever	
		n	%	N	%	n	%
Fluid offered to drink during illness	Less than usual	47	40.5	71	53.0	63	52.1
	About the same	40	34.5	47	35.1	44	36.3
	More than usual	29	25.0	16	11.9	14	11.6
Foods offered to eat during illness	Less than usual	73	62.9	83	60.1	84	70.0
	About the same	37	31.9	47	34.1	31	25.8
	More than usual	6	5.2	8	5.8	5	4.2

Level of Satisfaction of Mothers

The highest level of dissatisfaction during the facility visit to seek medical care was reported to the HEW/FLW to discuss child's problem or health issue. Relatively

speaking, the highest level of satisfaction was reported for the cleanliness of the health facilities providing care and treatment for sick children (**Table 5**).

Table 5: Level of satisfaction of mothers on the health care services for children with common childhood illnesses, Afar region, Ethiopia, 2016 (n = 255).

Services	Level of satisfaction(n = 249)		
	Not satisfied, n (%)	Somewhat satisfied, n (%)	Very satisfied, n (%)
Waiting time for service	150 (60.2)	54 (21.7)	45 (18.1)
Skill of personnel provided care and treatment	141(56.6)	44 (17.7)	64 (25.7)
Completeness of equipment and supplies	151 (60.6)	47 (18.9)	51 (20.5)
Ability of the HEW/FLW to discuss child problem or health issue	174 (69.9)	41 (16.5)	34 (13.7)
Quality of examinations and treatment provided	149 (59.8)	45 (18.1)	55 (22.1)
Availability of medicine	152 (61.0)	36 (14.5)	61 (24.5)
The working hours of health facility	153 (61.4)	48 (19.3)	48 (19.3)
Cleanliness of the facility	147 (59.0)	35 (14.1)	67 (26.9)
The cost of the visit and treatment provided	159 (63.9)	41 (16.5)	49 (19.7)
The privacy that was provided at the facility	144 (57.8)	41 (16.5)	64 (25.7)
In general, how do you rate the service you received from the facility?	148 (59.4)	39 (15.7)	62 (24.9)

Factors Associated with Feeding Practices of Mothers during Common Childhood Illnesses

The independent predictors of feeding practices during childhood illnesses were the availability of household assets (AOR 0.32, 95%CI: 0.12, 0.88), maternal knowledge about the frontline workers (AOR 0.24, 95%CI: 0.07, 0.86), ever use of vaccination cards (AOR 4.47, 95%CI: 1.78, 11.19) and information regarding danger signs of fever (AOR 7.57, 95%CI: 1.50, 38.17) (**Table 6**).

Table 6: Bivariate and multivariable logistic regression analysis on the predictors of feeding practices during childhood illnesses, Afar Regional State, 2016

Variable	Categories	Feeding practice		COR (95%CI) (p < 0.20)	AOR (95%CI)
		Less than usual	Usual and more		
Household assets	No	143	63	0.46 (0.24, 0.87)*	0.32 (0.12, 0.88)*
	Yes	25	24	1	1
Knowledge about the FLWs	No	158	75	0.40 (0.16, 0.96)*	0.24 (0.07, 0.86)*
	Yes	10	12	1	1
Availability of vaccination card	No	77	49	1.52 (0.91, 2.57)	4.47 (1.78, 11.19)*
	Yes	91	38	1	1
Information about danger signs of fever	No	134	80	2.90 (1.23, 6.85)*	7.57 (1.50, 38.17)*
	Yes	34	7	1	1

Note: *Significant at p-value <0.05

Discussion

The overall purpose of this study was to investigate the risk factors of parental feeding practices during common childhood illnesses among under five children from the pastoralist communities of Afar. Our results revealed that the parental feeding practices of under five children during common childhood illnesses were far from optimal. Very few proportions of the ill children were offered foods more than usual, 4.2% during diarrhea disease, 5.2% during cough and 5.8 during fever. Only few mothers or caretakers offered fluids to drink during diarrhea, cough and fever. The feeding practices during childhood illnesses were associated with the availability of household assets, maternal knowledge about the frontline workers, ever use of vaccination cards and information regarding danger signs of fever.

Feeding practices during childhood illnesses was found to be better in the households with assets compared to the households without assets which is in line with different studies. Household assets could improve child health via improved household environment and access to health services, where care givers can be counseled and educated on feeding during and after childhood illnesses. The positive impact of assets would ultimately lead to better feeding practices and better nutritional and health outcomes of young children. Household assets such as TV, cell phones, radios, refrigerators and others can motivate parents to back child feeding, serve as incentives to learn parenting skills and health knowledge, improve hygienic behaviors, create safe and healthy environment for children during childhood illnesses. Findings from over 1,000 households in Managua and Nicaragua reported that refrigeration leads to a 9%-

10% increase of the consumption of protein and Vitamin A and 1.5% of calorie [21]. Assets could target some causes of childhood illnesses. For instance, water contamination, which is one of the causes of water-borne diseases like diarrhea, can be prevented by buckets with covers. A randomized trial in Malawi indicated that the availability of buckets with a cover and a spout can significantly prevent water contamination and reduced diarrhea disease in children [22]. Improved stoves have been reported to reduce in-house air pollution and hence the risk of respiratory infections, such as pneumonia [23, 24]. Households with a toilet are valued higher than those without a toilet and the ownership of a toilet is negatively correlated with intestinal infection in school children [25, 26]. Precautionary saving against the uncertainty of future healthcare expense could also be one of the motivations for accumulating assets. Hence, the household asset holdings could serve as one of the clearing methods to the most significant barriers for seeking and accessing healthcare where caregivers can get advises regarding child feeding practices during childhood illnesses [27]. For instance, when long travel time from home to healthcare facilities prohibits people seeking healthcare, the ownership of camels might be a direct solution. Thus, feeding practices during common childhood illnesses can be addressed through the establishment of a comprehensive asset-based intervention in the pastoralist communities of Afar and other regions of similar setting in the country.

Knowledge of mothers about the frontline health workers was associated with optimal feeding practices during the period of common childhood illnesses. Children of mothers who knew the frontline workers were more likely to be fed more than usual. Mothers may require skilled feeding support from a health worker during the period of childhood illnesses. This support can be provided by trained health workers in health posts, health centers or hospitals. Close relationships and acquaintances of the mothers with the frontline health workers might have exposed the mothers to various advices and helped mothers to optimally utilize the advises to increase the intake of additional foods and drinks during childhood illnesses as recommended by WHO [28]. There should be no missed opportunities for supporting feeding in any contact that a mother and child have with the health system, whether it involves health posts, health centers or hospitals. Lay or peer counselors who have the skills and knowledge to support optimal infant and young child feeding can also contribute to improved feeding practices [29]. Health workers particularly the frontline workers had a critical role in promoting and supporting infant and young child feeding. The advice given by frontline workers has been identified as one of the key determinants influencing mothers' feeding practices. Frontline workers, therefore, should have the necessary knowledge and skills to counsel caregivers and help them overcome feeding difficulties when they occur. Thus, building the knowledge, skills and capacity of the frontline health workers is an urgent priority to improve the feeding

practices during the period of childhood illnesses [30].

Sick children of mothers who had the vaccination card were feeding less than usual compared to the sick children of mothers who do not have vaccination cards unlike the study conducted in Uganda [31]. Caregivers from Uganda who took their children for de-worming, DPT3 and measles vaccinations were more likely to feed their children with adequate diets [31]. It was not clear why having a vaccination card at home was less likely to encourage beneficial feeding practices during childhood illnesses in the study communities from Afar Region. However, the efficacy of vaccination given to children as protection against infections may be reduced by nutritional deficiencies arising from sub-optimal feeding practices during childhood illnesses. Thus, it is important for the health care workers from the study communities to make sure that the children coming for vaccination are not suffering from malnutrition or to plan vaccination campaigns in a season or time when the children's nutritional state is at its best.

The study revealed that knowledge of at least one danger sign of fever considerably increased the likelihood of mother and/or caregiver to feed more during childhood illnesses. This is not surprising as knowledge of danger signs is expected to evoke a quicker response to seek healthcare services. Fever is one of the common childhood illnesses that can easily be detected by mothers and hence could be the most frequently recognized danger sign which prompted the most healthcare facility

visits by respondents. Such an early response and presentation to the health facility can be considered an entry point for counseling and advice on infant and young child feeding practices. There is, therefore, urgent need to incorporate and/or consolidate the counseling and education of mothers during antenatal care and well baby clinic visits on these danger signs. The counseling and education should specifically focus on how to recognize danger signs and the most appropriate action to take when feeding the sick child especially in pastoralist communities where expert medical help may not be within immediate reach. Thus, building the knowledge, skills and capacity of health extension workers and frontline workers to provide mothers/caregivers with accurate and timely information regarding the danger signs and infant and young child feeding practices is an urgent priority to improve infants and young children feeding practices during common childhood illnesses.

The majority of the mothers in this study restricts food or offer less food than usual during childhood illnesses. In line with these findings, significant number of studies indicated that feeding restrictions during common childhood illnesses were frequent [32, 33]. Common childhood illnesses could result in loss of appetite, increased nutrient and energy requirements and/or decreased absorption of nutrients consumed, which triggers further weight loss and increased susceptibility to further infections. As a result of the loss of appetite, children would eat less and if this continues for some time, it can adversely affect the nutritional and

health outcomes. Catch up growth that could occur during the recovery period might be hampered due to inappropriate feeding practices after illness in the pastoralist communities of Afar Region of Ethiopia [1]. It has been difficult to establish continued feeding in spite of a wealth of evidence supporting the role of continued nutrition in improving gastrointestinal function, anthropometric, biochemical and clinical outcomes [34, 35]. This is believed to have contributed to the high prevalence of child under-nutrition in the region.

As limitation, the survey did not collect information on intake, nutrient density, frequency, quality and quantity of food given to the children. However, the most common type of staple food in Afar is bread accompanied by milk or, on rare occasions, meat.

Conclusions

The findings indicated that infant and young child feeding practices during common childhood illnesses is far from optimal and may account for the high levels of child under-nutrition in the pastoralist communities of Afar. Very few proportions of the ill children were offered foods more than usual. Few mothers offered fluids to drink during diarrhea, cough/pneumonia and fever. The feeding practices during childhood illnesses were associated with the availability of household assets, maternal knowledge about the frontline workers, ever use of vaccination cards and awareness regarding danger signs of fever. Improving economic status of the communities; provision of nutrition education on child feeding practices during house to house,

antenatal care and well baby clinic visits; and building the capacity of mothers to recognize danger signs during common childhood illnesses are recommended.

Conflict of interest

The authors declare that they have no conflict of interest.

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Author contributions

AM, AAM, HM, AGM, AK were involved in the conception of the project. AM and GR were involved in designing and writing the manuscript. AM, HM, AGM, AK, FH and AAM were involved in data collection, analysis and interpretation of the findings. All authors approved the manuscript.

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